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THE PSYCHOLOGY OF PIANO INSTRUCTION.

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Learning to play the piano, like all other learning processes, involves the acquisition of certain associations, which, with repetition, become habitual. When all the associations that may possibly be made in this particular learning process have been considered, we begin to wonder whether the various 'piano-methods' of instruction take account of them all, or whether they advocate the formation of some of them and forbid the formation of others. We may further raise the question: is any allowance made in these methods of instruction for possible individual differences of mental composition or tendency, or is the same method intended to apply to all cases?

While these questions do not seem to have been asked or answered directly in any well-known 'method' of piano instruction, the psychological implications which they involve are often enough present in these books. And indeed, several writers have referred to a 'piano psychology' as if such a branch of the science were actually in existence. Of the statements to this effect that have appeared, not the least emphatic is this one: (16.)

> The new psychology is abroad throughout the land and is fast revolutionizing the old methods of piano pedagogy. . . . The technical philosophy of the new psychology is based on the psycho-

logic and material fact that technic is incidentally but none the less thoroughly mastered when employed on work that enlists both heart and mind.

Numerous well-known books of piano instruction, furthermore, persistently, though not always consistently, employ concepts which are obviously borrowed from psychology. In fact, some of these books differ one from another largely in the choice of what may be called a particular 'psychological method' of learning. Concretely, some books emphasize learning by visual presentation, or recalling by visual imagery; others emphasize learning by means of sensations of movement of the fingers. But, in spite of the statement quoted above, it is not evident from an examination of these books that the authors are acquainted, as a rule, with any details of the science of psychology. It is sometimes difficult, moreover, to ascribe the use of a definite psychological concept to an author who uses psychological terms vaguely or in a far from technical sense—witness the use of instinct in the following: (Burr, p. 26-7.)

The ability to strike the proper notes instinctively can be acquired and practice along certain lines will help toward this. We use the word "instinctively" advisedly. There is no time to think—that is too slow an operation for our purpose. . . . The mind must be unconscious of what the fingers are doing. Man is a "one idea at a time" animal, and he cannot direct two operations simultaneously.

In order, therefore, to understand more clearly the subject of habit-formation in piano-instruction, and possibly to reach some agreement in regard to it, the following study was made. Two questions at once arise: (1) Can we determine ultimately what mental associations bring the best results in the matter of piano-instruction, *i. e.*, what are the most efficient mental connections in the learning processes generally applicable to piano-instruction; and (2) Are these associations, when found, applicable to all individuals, or must we first determine the type of association to which the particular pupil belongs, perhaps by some sort of *mental test,* and then modify the method to suit the individual case?

Before we discuss this question, we shall present an analysis of the types of association which are actually recommended in a number of standard piano schools or methods. Our aim was to choose passages in these methods which clearly specified the most advantageous associations for learning, or else, to interpret the meaning of significant passages in the light of the context. To aid in this analysis, a table of abbreviations has been drawn up, from which symbols have been taken to represent briefly the psychological data contained in the passage to which such a formula of symbols was suffixed. We do not mean to place very much stress on this formula because in many cases, on account of its derivation from a doubtful interpretation of the passage, it may not be absolutely truthful to the facts.

Table of Symbols.

Kf = Kinaesthetic perception of movements of fingers, hand, arm.
Kn = Kinaesthetic perception of movements of throat in *naming* the note.
Kp = Kinaesthetic perception of movements of throat in singing the note (*pitch*).
Knf = Kinaesthetic perception of movements of throat in *naming finger* or hand to be moved.
Ap = Auditory perception of *pitch* of note.
An = Auditory perception of *name* of note.
Vs = Visual perception of location of note on *score* or staff.
Vb = Visual perception of location of note or finger on *keyboard*.
\+ = Sign of association.
— = Sign of prohibited association.
? = Sign of doubtful association.
Italics emphasize the association.
A symbol beginning with a small letter represents an *idea* instead of a *perception*, *e. g.*, vs = visual image or idea of note on the score.

The following extracts are accordingly put under appropriate psychological captions, and, wherever it is possible, formulae are appended giving a brief psychological interpretation of the passage:

KINAESTHESIS.

Each day you should read through a couple of fresh little pieces to accustom the eye and fingers to the various and ever new passages which are formed by means of the notes. (Burr, p. 11, quoting from Czerny.) [Vs+Kf]

Then he should place his fingers on a table as he would on a keyboard, to feel how the notes are to be played. [Vs+Kf]

You must not only be able to play your little pieces with the fingers; you must be able to hum them over without the piano. (Cooke, p. 47, quoting from Schumann.) [Vs+Kf, Vs+Kp]

This completes the ascending scale, which is now to be practised in all keys, styles of touch, and degrees of strength, at first in the slowest of tempos only. (Prentner, p. 20.) [Vs+Ap+Kf]

So by completed legato is understood the pressing down of a key by the finger already placed in contact with it ("prepared") without its having been previously raised above the note * * *. (Prentner, p. 12.) [Vs+Ap+Kf]

Press down the note audibly, giving an inaudible second pressure without re-raising the finger, for added exercise in strengthening the touch. (Prentner, p. 12.) [Vs+Ap+Kf]

Always count unless you are otherwise instructed by your teacher or have mastered your piece. This is of greatest importance. (Cooke, p. 10.) [Vs+Kf+Kn]

Name aloud each note, the finger that is to play it, and the touch that is to be used; then, and not until then, play it. (Cooke, p. 15.) [Vs+Kn+Knf+Kf]

These three scales * * * are to be practised with each hand separately, then with both hands together, until the pupil can play them without mistakes, and without watching his fingers. (Wagner, p. 47.) [Vs+Ap+Kf—Vb]

He should practise at first with each hand separately, and give the name of each note,—as *c, d, e,* etc. (26, p. 6.) He should therefore name and strike in order *c d e f g a b.* (Wagner, p. 3). [Vs+Ap+Kf+Kn+An]

Put the pupil where he cannot see the keyboard; play a tone; let the pupil tell you the octave it is in, and then try to strike it on the keyboard. (Brown, p. 4.) [Ap+Ks+Kh]

The pupil should say aloud: "This note is on the first line, and is called *e*." (Wagner, p. 7.) [Ap+vs?+Kn]

AUDITION.

Equally with learning the art of playing it is essential for the pupil to master the art of listening. (Tapper—e, p. 1.) [Kf+ap]

Thus the inner sense of tone is cultivated along with the training of the hand. * * * The author urges upon the teacher the necessity of establishing an inner sense of tone—of making tone objective, of studying it as a tangible element of art; also he urges the teacher to permit and to assist the pupil to hear as much music as possible. * * * Therefore the material of music, which is tones of various lengths, colors, and intensities, must be studied, learned, and appreciated through the ear; and it becomes as much our duty to cultivate a sense of tone appreciation as it is to cultivate the power of tone production. (Tapper—a, p. 1.) [Kf+ap]

In the pauses which thus ensue he will be able to call up before his mind that which he has already played, paying attentive heed to what has sounded * * *. (Prentner, p. 84.) [Kf+Ap+ap]

Hear yourself practice, and exercise strict self-censorship. (Cooke, p. 13.) Listen constantly, * * * (Cooke, p. 16.) [Vs+Kf+Ap]

But when you are playing with others a higher artistic element is involved—*that of listening,* and this does not mean a dim recognition of mere sounds, but a clear conception of what is heard. (Burr, p. 36.) [Vs+Kf+Ap+ap?]

The student should sing these examples many times until the mental (tonal) impression of the Cadence form is definite. (Tapper—a, p. 3.) [Kp+Ap+ap?]

After having struck any white key at hazard, you must describe in words what line or what space represents it. You must often play through slowly some of the easiest pieces for beginners, note by note, and with great attention, naming each note as you proceed. (Burr, p. 11.) [Ap+An]

Always listen while you are playing. Music is intended to be heard. If you do not listen to your own playing it is very probable that other people will not care to listen to it either. (Cooke, p. 7.) [Vs+Kf+Ap]

And since it is through the sense of hearing, either physical or mental, that music makes its appeal, it follows that musical education begins with the training of the ear—both the physical and mental. * * * The main thing is to get the student to hear through his eyes and see through his ears. * * * (Ehremayer, p. 66.) [Ap+vs, Vs+ap]

VISION.

In addition to the mere training of these fundamental notes and chords endeavor to form a mental image or picture in the mind of just how they appear on the staff, also above and below the staff. (Burr, p. 13.) [Kn+vs]

In order to attain great precision and clearness in playing, the student should attempt, after having mastered the correct position and movement of the hand, to practise difficult passages without looking at the keyboard. (Prentner, p. 84.) [Vs+Ap+Kf—Vb]

As each page is studied, apply these tests: With closed eyes, can you see the printed notes, with suggested phrasing, or the notes as they change on the keyboard? * * * When you strike at hazard any white key on the treble side of the keyboard, you must name it aloud and seek directly for the note belonging to it, that is find it on some piece of music, or write it on the music staff. (Cultivation of a sense of absolute pitch?) (Burr, p. 11, quoting from Czerny.) [vs, vb, Kf+Kn+vs]

A device for aiding visualization is the following:

> Cut a square hole in a card, the depth of which may be made to cover one or two staffs according to the demands of the instrument performed. The width (or length) of the opening must be determined by the amount of notes the eye can accurately discern at the beginning of the trials. * * * Lay this card on the staff, and glance quickly at what the opening reveals. Look away again, and try to interpret quickly (mentally) what the glance has disclosed. (Burr, p. 17.) [Vs+vs?+a?+K?]

It is hardly worth while to summarize opinions of so varied a character. A perusal of the appended formulae show very little similarity. Perceptions of movements made by the finger, hand, and arm are emphasized in connection with the visual reading of the notes. Thus we have Vs + Kf appearing three times, and its variation, Vs + Ap + Kf, also occurs three times. The last formula is also modified in many ways when, for instance, definite instruction is given not to visualize the keyboard and we get Vs + Ap + Kf — Vb. Kinaesthesis of naming or humming the notes, or of counting, is likewise mentioned as significant in connection with reading and playing the score. Two instances are also given showing that association between the auditory and kinaesthetic perception is advantageous. Kinaesthesis of playing is linked with auditory ideation of the note to be played, the reverse of the above, in two or three passages. Visual perception and ideation is not emphasized so much, although in one case a device is outlined by means of which it is possible to emphasize visualization. In this sense-department there appears to be the least uniformity of opinion, but in the few cases where it is mentioned unusual weight is given to the statement.

Memory. A favorite topic of discussion is the manner in which memory may be cultivated, how musical compositions may be retained. In this connection, the relation between the type of presentation and the adequacy of reproduction is variously stated by the several writers. Practically no one seems to agree in opinion with the results of Henmon (12) which contradicted the traditional laws, stating that with young children auditory presentation gives the more correct and lasting reproduction, and with adults visual presentation

is the more effective, and which proved that auditory presentation is the best, auditory-visual the next best, and that pure visual presentations are the least efficient for carriage in the adult mind. Many aspects of the problem of memory appear.

The teacher should have his pupils sing a certain tone and then say, "Remember this tone; sing it again and again; keep it in the mind as you carry a pencil in the pocket; and when you return home sound it on your piano as a test." (Breithaupt.)

Is each finger sure of its proper place in each phrase or passage? In memory work can you place your fingers with absolute certainty upon correct notes, or do they move automatically? Is your memorizing the result of a good ear or a well-trained mind?

Does the practice of memorizing interfere with being a good reader of music? (Bintliff.)

Memory training is invaluable to the pupil who is constantly dreaming. (M. G.)

* * * first impressions are the most lasting. (Wagner, p. 4.)

As regards learning by heart,—which power develops of itself through inward listening coupled with the imprinting on the mind the image of the notes,—it is advisable, as a test of memory, to go through the piece mentally only, without looking at the music and without a piano. (Prentner, p. 83.)

First memorize mentally the section you have selected for study, and then practice it. If you do not know it well enough to practice it from memory, you have not grasped its musical content, but are playing mechanically. Occasionally memorize backwards, that is, take the last few measures and learn them thoroughly, then take the preceding measures and continue in this way until the whole is mastered. (Cooke, p. 6.)

Cultivate sight-reading and memorizing; both are valuable aids to musical progress. (Cooke, p. 13.)

It is, broadly speaking, the memorizing of short tasks and, when possible, pleasant ones, and constantly and systematically reviewing them from memory. Whenever they are interesting they will cling to the memory with the least effort, and their brevity will prevent mental exhaustion during their mastery. (Singer, p. 89.)

It should be borne in mind that in many respects the process of acquiring a strong verbal memory is very similar to that of strengthening the musical memory. (Singer, p. 92.)

The visualizing process alluded to further on may be employed with considerable success in memorizing music. * * * This is one reason why the best typographical edition of a piece of music is preferable. * * * The ideal condition of memory is when it concerns itself directly with the thing to be memorized, and automatically reproduces it. * * * For the discipline in memoriz-

ing at first hearing the student should proceed as follows: Let an assistant or companion sing or play a short melody with great distinctness. The student should then, with his whole soul in the effort, try to produce as much of it as possible. * * * The reproduction of music at a first reading is more difficult. To succeed in this, great mental concentration is essential, and this power should be strengthened by every means possible. (Singer, p. 102-105.)

[Vs+Ap+Kf+*vs*]

LEARNING. A system of learning by groups is advocated and often strongly emphasized by many writers. Suggestions as to concentration of attention, possible range of attention, fatigue, formation of favorable habits in learning, division of practice period, and general and miscellaneous instructions with respect to the learning process have been included under this caption.

(Attention.)

With reference to the musical illustration, it is a matter of course that the acquisition of technique presupposes previous practice. This practice, in rendering the fingers more and more independent of the attention, frees consciousnesss to that extent. * * * It is as though every action of the fingers wore grooves into the memory which made it easier to acquire new impressions; and the attention being relieved from all mechanical obstacles, can busy itself in the most unembarrassed manner in the act of memorizing. Restated, the less the number of elements with which consciousness has to deal, the greater the power which it can exert on any given one. (Singer, p. 94-95.) [Kf+*kf*]

Let one of these selections, technically well within the grasp of the student, be so thoroughly mastered that he may be able to play it while conversing or thinking of something entirely different. (Singer, p. 91.)

Attention should be directed at a concert to the different instruments as each in turn takes up the motive. (Singer, p. 101.)

Concentrate during every second of your practice. To concentrate means to bring all your thinking powers to bear upon one central point with the greatest possible intensity. * * * "The evidence of superior genius is the power of intellectual concentration." (Cooke, p. 5.)

Inhibit every extraneous thought, and concentrate the mind intensely on your work. (Cooke, p. 16.)

One glance at the page, followed by the effort to reproduce, so to speak, that page on the keyboard, has an influence on the memory

far more powerful than long continued study. The secret is that the brain is concentrated, although for only an instant, while in the second case the brain wanders and must be forcibly brought back to the subject. (Brown, p. 33.)

(Attention and Practice.)

In order to prevent any slackening of attention, it is advisable to make the practice periods short and divided from one another by pauses. (Singer, p. 83.)

Divide your practice time into periods of not more than two hours. You will find it impossible to concentrate properly if you attempt to practice more than two hours at a time. (Cooke, p. 5.)

Do not attempt to practice your whole piece at first. Take a small section or even a phrase. (Cooke, p. 6.)

Divide the practice hour into periods. (Cooke, p. 15.)

Divide the piece into very short sections, * * * (Cooke, p. 16.)

No student of common sense would ever dream of becoming skillful by days of unremitting labor sandwiched in between weeks of idleness. (Singer, p. 110.)

Hasty practice is delusive in results, both to the fingers and the mind. (Singer, p. 106.)

Never attempt to play anything in public that you have just finished studying. When you are through working upon a piece, put it away to be musically digested, then after some time repeat the process, and again the third time, when your piece will have become a part of yourself. (Cooke, p. 7.)

It has long been advocated that the way to fix a matter well in the mind is carefully to think it all over before retiring [Incubation?]. Such practice, however, is of doubtful benefit at that time in case of fatigue or exhaustion. (Burr, p. 13.)

The best teachers will not permit a pupil to practice until thoroughly fatigued; they insist upon frequent periods of rest and change in the exercises. The progress is then more rapid. So with the mind. * * * (Burr, p. 31.))

Always practice slowly at first. (Cooke, p. 6.)

It is particularly helpful always to play the scale in strict rhythmic time. (Prentner, p. 32.)

If read in a monotonous tone, it will be necessary to repeat a paragraph many times in order to memorize it; but let the emphatic elements of a sentence or paragraph be strongly marked, in fact exaggerated, and observe how much more quickly the thought and phraseology fasten themselves upon the memory. (Singer, p. 96.)

In the effort to surmount these unfavorable elements of practice, the author conceived the idea of putting the scales and arpeggios,—radical elements of brilliant passage playing,—into metrical form,

the sole object at first being to compel close attention on the part of the pupil; in other words, to secure mental concentration. (Mason, p. 6.)

Always practice rhythmically, with strongly marked accent. (Cooke, p. 42.)

(Habit.)

When studying, remember that practice is simply a means of cultivating habits. (Cooke, p. 6.)

Have a daily routine of purely technical work, * * * (Burr, p. 13.)

Have a fixed time for practice. * * * Just so with practice; do not expect progress if you practice fifteen minutes one day, nothing the next, and three hours the third day to make up. (Cooke, p. 14-15.)

Having a good general idea of all that has to be done, one should make a well-defined division of the study time, since regularity leads to the best results. (Prentner, p. 83.)

SYNESTHESIA. An interesting suggestion involving 'colored hearing' [*v.* Galton, (p. 106) and Titchener, (p. 195)] is found in the following statement:

THE COLOR SYMBOLS OF TONES. Children naturally delight in bright colors, and when these are associated with sweet sounds they appeal strongly to the child's sympathies. The association of tones with colors is not an arbitrary matter, for there is a natural relation between them. Science shows an interesting correlation in the properties of tone and color; but it is enough here to notice that the mental impressions produced by the colors are similar in character to the impressions produced by the corresponding tones. Thus the strong vital effect of the keynote is allied to the warm red color at the base of the spectrum. (Batchellor, p. 7, *v.* also p. 57.)

Colored balls are recommended for use with children in connection with learning the sound and names of musical tones.

Owing to the tangle of confused opinion in regard to the proper principles to be applied in the field of piano instruction it is evidently not possible to draw any definite conclusion from the statements made except that there is a vast difference of method. This difference is well expressed by one writer who says:

Some teachers insist that the pupil shall memorize a practice piece, contending that with the mind engrossed with the complex problem of reading the music symbols, locating the notes on the keyboard or frets of the fingerboard, properly adjusting the fingers, and paying due attention to the accent and rhythm, it is impossible to perform all these operations simultaneously in a way to secure the best results of the practice as to mechanical execution. Others insist that the pupil keep his eyes fixed constantly upon the music in order that the exercise of reading music may proceed with the manipulation of the instrument. (Burr, p. 9.)

One way out of the dilemma is found by a speaker at the conference of the Music Teachers' National Association:

Everybody must be his own Columbus, and discover in his own hands, heart, and soul how to play the piano. (19, 1911, p. 115.)

But, if we are not to depend, at least in part, upon the scientifically tested and classified experience of the past; if we must rediscover those pedagogical principles which have been available in the past, there will be some successful training by mere chance, while many attempts to give this sort of education will be futile. We may sympathize with the author who writes:

When a pupil, thus misled for 9 or 10 years, arrives at maturity, he drops piano playing; for the pieces studied, and that, too, imperfectly, become distasteful, and real music is a thing unknown to him. Time and money are lost, and all his toilsome study has rather injured than benefited his mind, so that it would have been better had he never studied music. (Lebert, p. xiv.)

It is conceivable that a pupil thus unfit, or thus deficient, could have been told of his unfitness, or could have been made fit, if certain mental tests had been applied, or if some well-established pedagogical principles had been available for use. As one teacher puts it:

If a pupil is backward, the teacher should use all his powers of observation, all his analytical skill, all his scientific acumen to discover and remove the cause of the backwardness. (Ehremayer.)

But the power of analytical skill is useless, unless there are scientific tools, mental tests, with which to analyze; "scientific

acumen'' is inferior to scientific knowledge. In conversation with a piano teacher, the statement was made by her that she attempted to 'round out' the pupils. The attempt is laudable, but the result must, as far as scientific accuracy goes, be woefully inadequate. There are wide differences in individual minds. An instructor in psychology and a musician of ability observed that he had very few auditory images. Tones were carried by means of throat-kinaesthesis. Another former assistant in the laboratory, with considerable musical ability, carries tones by means of verbal kinaesthesis, *i. e.*, by their *solfeggio* names. Another psychologist has difficulty in transposing a tune carried auditorially into kinaesthesis of finger movement. Until we use adequate tests for these peculiarities, until we have determined the pedagogical principles applicable, and until we have decided the norm of instruction to which these cases are to be standardized, we are in a hopeless sea of confusion, and successful results will be almost accidental.

Attempts have been made to do something scientifically for the singer. Seashore has outlined a program. In his closing paragraph he remarks:

> After all, pure psychology will be the chief gainer. One cannot observe under controlled conditions in a field so rich and unworked without gathering new facts, correcting errors, broadening views and deepening insight into the nature of the mental processes involved in music. Applied psychology of music is to pure psychology of music as engineering is to physics; they must go hand in hand. (22, p. 211.)

And, indeed, there have been beginnings, too, in the psychology of piano-playing. Raif (21) found that virtuosi do not have an abnormal dexterity of finger movement. Five to six taps per sec. with the second and third fingers, and four to five taps with the other fingers is the best that anyone can do. In the trill where eight to twelve tones are produced per second, more than one finger is, of course, in use; above that number the ear is not able to detect separate tones. He found that cultured people are, as a class, more dexterous than uncultured. In another investigation he took 18 of his pupils after he had determined the rate for each hand (♩ = 116 for the left; ♩ = 120 for the right), and compelled them to practice only with

their right hand. After 8 days' practice the average for the right hand was 126, after 16 days it was 132, and after 2 months it was 186. Then, without practice, he tested the left hand, and found that its rate had suddenly risen to 152. In still another investigation he proved that a composition can be played more readily after it has been heard than before. In general he concludes (21, p. 355):

> We put altogether too much emphasis in the musical training of our pupils on the dexterity of the fingers, and pay too little attention on the coöperation of the finger, ear, and eye. We have to instruct our piano pupils how to become proficient in thinking, not in finger execution.

In much the same way have Binet and Courtier (3) 'blazed the trail,' as Seashore puts it, by tracing graphically the intensity, form, and time of finger-movements in piano-playing. They point out the immense psychological interest there is in determining the kind of experience involved at the keyboard of a piano, and the type of movements executed; while at the same time graphic results obtained in this manner act as checks upon the performance. Illustrations are given, for instance, to show the curve of a trill well performed in contrast to that of a trill poorly performed.

But all this is only a beginning. After we have established psychological principles upon which to work, we may hope to build up a pedagogy of piano-instruction that will take the place of the heterogeneous mass of unsystematized dogma which we have culled from the current literature.

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THE COURTIS TESTS IN THE SCHOOLS OF NEW YORK CITY.[1]

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For a number of years there has been a growing disposition among educational thinkers to seek to base their conclusions upon data quantitatively determined rather than upon the dictum of an authority. Reactions to known conditions and under rigid control have been analyzed, measured, counted, and tabulated. The attempt is being made to substitute for the dogmatic guess of the lecturer or essayist the scientist's precise statement of fact. The phrases and fine words with which pedagogical literature has been so handsomely adorned seem to be giving place to numerical expressions (tabulations, distributions, graphs); and to conclusions based upon these (statements of laws, tendencies, and relationships.) The new turn which educational thought is taking makes fair promise of offering something fundamental and satisfying to our knowledge of processes and products. It seems surely destined to make substantial changes in our estimates of methods and results. No doubt it will not settle all perplexing questions, but it will settle many, and it will contribute to the settlement of others. Its possibilities, especially when co-operatively handled and uniformly controlled, are great and destined to become greater. No one, I should think, who wishes to be an authority in pedagogical matters, or even to be well informed, can any longer neglect the quantitative method of treating educational questions.

One of the fields to which this method has been applied with attractive prospects of success is the measurement and standardization of school products. It was, therefore, quite to be expected that when the Committee on School Inquiry of the City of New York decided to investigate the teaching of arithmetic, it should base its report in that subject upon a statistical analysis.

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[1]Report on the Courtis Tests in Arithmetic, by Stuart Courtis, made for the Committee on School Inquiry of the Board of Estimate and Apportionment of the City of New York. Transmitted February 19, 1913.

In choosing Stuart A. Courtis, the originator of the Courtis Tests, to make the investigation and write the report, the Committee made the best possible selection; and the result is a monograph which is one of the most valuable of the "Interim Reports." It contains unnecessary and tedious matter, especially in the first forty-five pages. Its author evidently lacks the statistical training to subject his data to the most effective analysis. It overlooks some important matters which would, if included, considerably augment its value. It is also carried out upon some assumptions which I shall attempt to show are erroneous.

But it is, with all its faults, an admirable contribution to our knowledge of the behavior of the Elementary School children of this city (and indirectly of the country) in a part of the subject of arithmetic. If Mr. Courtis had given us no more than his tests, with the tabulations for each of them, of 27,000 children, he would have performed a great service. But he has given us much more than this. He has told us how to give the tests, their order, time allowance, and directions to examiners and to children. He shows how the tests came to be as they are. He publishes his score sheet and tells how to use it. He gives his standard scores by which to estimate the performance of an individual, a school, or school system as above or below what he states to be standard conditions. As one of the most suggestive devices in the report he presents a "Comparative Graph." By it the achievement of an individual or a group in the Courtis Tests may be plotted and automatically compared with "standard" grade performances for each test. The Standard Scores (in the tabular but not in graphic form) had been published before. (Elem. Sch. Teacher, Vol. 12, p. 127.) All the rest of the above material, including the tests themselves, had not been available except to such superintendents and principals as had given the tests under the author's co-operative plan.

In some respects Mr. Courtis has been remarkably effective in his graphic representations of facts otherwise presented in tabular form. The device to picture the extent of overlapping (p. 51), the figure to show how greatly the individual scores of a class exceed in range the average scores of classes

of the same grade (p. 65), the curves to represent the inequalities of individual development (p. 68)—these and several others equally good show a resourcefulness in the use of diagrams which deserves to be commended. In fact, for some purposes, Mr. Courtis uses diagrams (e. g. in his treatment of relationships) when he might better have expressed the same facts numerically after having given his distributions.

He has also been peculiarly successful in interpreting his tabular matter concretely. He has a vital grasp upon what the cold figures mean. The following is an example:

"To make plain the extent to which one grade overlaps another, if every child in the sixth grade were, when possible, mated with a child in the seventh grade, whose score was the same as its own, seventy-nine children out of every hundred would be mated on the basis of scores in examples attempted, and eighty-one out of every hundred on the basis of scores in examples right. That is to say 80% of the children in either grade could be replaced by an equal number of children from the other grade without changing the ability of the grade in this test in the slightest."

Such statements—especially as regards the variability of individual and grade scores—are numerous, and they add materially to the interest of the report.

The recommendations made at the close are valuable, or at least they would be if we had the means of carrying them out. There is no doubt in ony one's mind, I should say, that great and permanent value would accrue, not only to the schools of New York, but also to the entire educational world, if we could study, as suggested, four groups of 1000 children each for each grade from 3A to 8B over a period of a year (p. 156, 157.) But such a study of 48,000 children could not be undertaken without a form of central control which is quite out of the question until there shall be in existence some sort of a bureau whose duty it shall be to perform this kind of service. The creation of such bureaus in our more progressive city systems is likely to become general. In fact, largely as a result of the recommendations of the School Inquiry Committee, a Division of Reference and Research has lately been established in the Department of Education of the City of

New York. The whole trend of educational thought toward the supplanting of opinion by scientific certainty will make demands upon the time and energy of existing officials which they will not be able to meet even if they should possess the requisite knowledge and training, which in most cases they do not.

We shall now take up briefly the tests themselves.

In the first place, they may justly be regarded as the most complete and satisfactory tests in arithmetic that had then been devised. No others already in existence at the time could have been used that possessed the same qualities of mchanical excellence. None could have been secured that by their wide previous use would enable comparison of local conditions with conditions throughout the country.

This is not, however, to say that more perfect tests may not be devised. The assumption that all grades are really tested by the *same material* will have to be abandoned. In spite of some low scores, the tests in table work (Tests 1-4) are too easy for upper grades. In these grades where one child secures a higher score than another, it is not necessarily because of superior knowledge of the tables. It is mainly because of superior manual dexterity. On the other hand, some of the tests are too hard for lower grades. This is especially true of Test 8, Reasoning, which on this as on other grounds is the least satisfactory. A test which is so hard for a grade that 87 pupils out of every 100 cannot get a single example right does not test that grade at all. Among the 4679 pupils in the 4th grade who thus failed absolutely, there were all levels of ability except the highest. This test fails completely to reveal that fact. It is certain that the distribution of ability in the 4th grade is practically "normal," i. e. there is a certain typical ability which more children have than any other, while the number having greater or less ability grows smaller by a known law according as their ability differs more and more widely either way from the typical ability. An adequate test should reveal such a condition.

I think there is good reason also to object to Test 6, Speed Reasoning, or at least to the manner of giving it. What we want in our schools is less speed in reasoning, not encourage-

ment to more speed. We want fewer snap judgments and more real thinking; and thinking takes time. When a test like this is given, especially in lower grades, what we get is not reasoning, but absence of reasoning. The problems are all of one operation, and children are required merely to indicate the correct operation, i. e. addition, subtraction, multiplication, or division. We are not given a tabulation of this test in such form that we can answer a question like this: Of the eight fourth grade children who attempted 16 (all) examples in a minute, how many examples did each one get right? By mere chance and without the exercise of any reasoning at all they ought on the average to do four correctly. From the average scores in the fourth grade (3.5 attempted, 1.8 right) we are justified in accounting for one-half of the "rights" (0.9) on the basis of pure chance.

What we really need is a series of several tests in fundamentals and another series in reasoning, each test more difficult than the preceding one by a known amount and each adapted to two, or three, or perhaps four consecutive half-yearly grades. The span, in short, between the fourth and eighth year grades—to say nothing of the high school grades—is too great for any one test to bring out satisfactorily the distribution of ability at both ends. A series of tests such as I have suggested may be obtained by a sufficiently extensive preliminary testing with many problems. It would involve time, labor, and expense; but it would not be impracticable if carried out by a body of investigators who appreciated the problem and knew how to attack it. Moreover, it would not confine the testing so narrowly. The tests which are used in this report do not test all the arithmetic work of the elementary school. Common and decimal fractions, percentage, and interest are topics which, no matter what are the disagreements about courses of study, everybody admits belong in the work of the elementary school. A form of testing which should take account of them would therefore more satisfactorily evaluate the product of the schools in arithmetic. The present method of using the same material for all grades makes this impsssible.

One more desirable improvement of the tests may be sug-

gested. The score being taken for each test as the number of problems attempted or correctly worked, the establishment of equal units is imperative. Mr. Courtis is aware of this and indicates that he is working on it (p. 21). Meanwhile, however, the inequalities are very real. The mechanical plan of counting one for each item of work and constructing (Tests 7 and 8) examples each involving fifty counts does not at all insure equality. Matters cannot be settled that way. Examples are not difficult or easy because we think so, nor are they of equal difficulty because "it is believed they would be of equal value to that ideal individual who could add, subtract, multiply, divide, copy figures, and 'borrow and carry' with equal facility." Such an ideal is too remote to be of any practical value. The obvious way to determine the relative difficulty of problems is to find out how often children get them right. If the material of Tests 6, 7 and 8—Speed Reasoning, Fundamentals, and Reasoning—was given to sufficiently large groups of children and time enough allowed for all examples to be worked, the relative difficulty of the examples could be ascertained. It is not at all necessary that they should be of equal difficulty. They may be given various weights.[1]

The fact that they are not of equal difficulty although so treated cannot be fully shown by any tabulation which Mr. Courtis gives. It is, however, suggested for Test 7 by Table XLIX, p. 142 where of 447 children attempting two examples, 69% did the first correctly and only 36% the second, i. e. only about half as many children did the second example as did the first. There is also a suggestion for Test 6, Speed Reasoning, of the inequality of units that are called equal. Table LI, p. 144, gives by grades for two schools the per cent of accuracy in the first four problems. The discrepancies are particularly marked in the lower grades, as is to be expected. For the 4A to 5B grades the percentages are as follows:

	Example 1.	Example 2.	Example 3.	Example 4.
4A	52	45	19	34
4B	64	28	24	69
5A	84	45	36	53
5B	78	38	30	65
Average	70	39	27	55

[1]This means of determining relative difficulty and of weighting was used by Stone. See his "Arithmetical Abilities."

Examples some of which are worked correctly by half or less than half as many pupils as succeed in working others correctly are by no means of equal difficulty.

For Test 8 (confessedly the least satisfactory) there are no data in the report to show the relative difficulty of the problems. I should, however, expect the discrepancies to be even more marked than they are in Tests 6 and 7, and Mr. Courtis evidently feels that this is true. See pp. 25-27.

I think one assumption has done more to weaken the tests than any other, the assumption, namely, that the same tests must be taken by all the grades. The effect of this will be at once evident in Test 7, p. 22. Although in New York the tests were not given below the fourth year, they have been generally offered in the third grade and sometimes in the second. In order to make this at all possible the first and second examples are each in two parts. Now, no one, I should suppose, would believe that two small examples, even when together they contain the proper number of "items of work," are of the same difficulty as one long example. At least the results above referred to do not support such a belief. The solution of the difficulty may very probably be, as pointed out in another connection, the devising of one series of tests in abstract work and another in concrete work.

Passing from the consideration of the tests themselves to the treatment of the scores in them, I observe in the first place that, although Mr. Courtis realizes the insufficiency of the average as a measure of central tendency, he invariably uses it, and that he uses no other. The median and quartile measures would have been much more valuable and could have been made even more significant for the group of persons for whom his report was intended. The mode, although hard to calculate by a refined process, could have been approximated and rendered even more significant because of its concreteness. Modal children exist in large numbers. The average child may not exist at all.

But a more important measure is one of variability. The two most important single measures of a distribution are the measure of its central tendency and the measure of its closeness of grouping about the central tendency. Neither measure

alone is sufficient. It is a remarkable fact that although this report makes so much of the variability of individuals and classes it offers no measure of it. The standard scores and the scores for New York schools which are compared with them are all on the basis of averages. There would be a vast gain for the report if it offered not only standards of central tendency, but also standards of variability.

The impression is everywhere created that variability, no matter to what extent, is undesirable and is a direct indication of inefficiency. Nothing can be further from the truth. Variability is the largest word in the mental make-up of human beings. An excess of it, especially in abilities so fundamental as those here treated, is to be avoided. But the attempt to flatten all to the same level or anything which approaches nearly the same level is as wasteful as it is futile. How much variability within a grade is a symptom of healthy conditions is a matter about which we should very gladly have information. It would have been a great addition to the value of this report if instead of giving the impression that any amount of variability is a symptom of inefficiency it had stated between what limits a certain per cent of the cases in each grade for each test ought to lie. Pupils whose scores lay outside of such limits, supposing the limits to be acceptably defined, might be re-graded or given individual treatment.

In regard to this matter of extreme variability we ought to say (as Mr. Courtis himself plainly states) that this is no indictment of the New York schools in particular, but of all schools in general.

Mr. Courtis has made an important contribution to our means of control in arithmetic by publishing his Standard Scores. He has applied these to the average scores obtained in New York and finds that the latter are high in speed and in abstract work, but very low in reasoning. This constitutes the only direct indictment of conditions in the New York schools. In fact, it may be as well to say in this connection that the Courtis Report is hardly a criticism of the New York schools at all. Most of the newspaper quotations in which school efficiency is represented as low really referred in the Report to general conditions throughout the country. The Report is in reality a monograph on individual variability.

In proposing standard scores by which to diagnose and control conditions, Mr. Courtis has, as I have said, made an important contribution. They were derived in the testing of "approximately 10,000 children from some seventy schools in ten states" (Report, p. 10). They are not the *average* scores obtained from this testing, as is made clear in the article (Elementary School Teacher, Vol. 12, p. 127) in which they were first published. They are higher than the average scores and were derived, as Mr. Courtis said when he first made them, from the grade averages and from the distribution from which the averages were computed. He continues: "For each test an eighth-grade score was selected such that it was equalled or exceeded by 30% of the eighth-grade children measured. This score was plotted and a smooth curve drawn having the same general form as the average curve and coinciding with it in the lower grades. The scores for each of the other grades were those determined from the graph." (Elem. Sch. Teacher, Vol. 12, p. 133.) These are the scores given in Table XXXVI, p. 96 of the Report. Translated into words, he says: "*At the end of the year's work* an eighth-grade child should be able to copy 117 figures in a minute; to write answers to the multiplication combinations at the rate of forty-nine answers to the minute, etc., etc." (The italics are mine.)

We are now prepared to see how these standard scores were applied to New York City conditions. I do not for a moment deprecate the setting up of scores above the conditions as found, nor do I think there is any intention to be misleading in the Report. But in effect it is exceedingly misleading. I observe in the first place that no where in the report do we get any other notion than that the standard scores are the average scores obtained by testing these 10,000 children in seventy schools. To learn the fact that they are really idealized scores we have to go to the report of how they were set up. In the second place I observe that when translated into words they refer to conditions at the end of the several school years. And in the third place, I have every reason to believe that the seventy schools from which the scores were taken were by no means typical schools.

In the article in the Elementary School Teacher above re-

ferred to the curves for *average* (not standard) scores in the seventy schools are given. When these are inserted in Figure XXI of the Report on the New York schools the picture is materially changed. *In six of the eight tests the New York average scores are handsomely ahead of the average scores of the seventy schools, and this is true without an exception in every grade of the elementary school.* It is notably true in Test 7, Fundamentals, which Mr. Courtis calls "The most important, and from some points of view the most complex, of the series." (Report, p. 21.) In the remaining two tests—the reasoning tests—the New York scores are in most grades lower, but they are not nearly so much lower as Figure XXI of the Report would lead us to suppose. The discrepancy is reduced by a full half; and while it may be a matter of regret that the New York schools should be in any respect or to any degree inferior we need not be unduly alarmed at this slight falling off, especially in view of the marked superiority in every other test and also in view of two other facts which I now wish to point out.

From the quotation above it appears that the "*end of a year's work*" is in mind in making up the standard scores. On p. 33 of the Report we are told that the testing was all done between March fifteenth and April twenty-sixth. Half of the children at the beginning of this period had completed twenty-six weeks and the remaining half six weeks out of the forty weeks of the year in which they were graded, that is, one-half had done a little over five eighths (i. e. twenty-six fortieths) of the year's work, while the other half had done but little more than one-eighth (six-fortieths) of it. To compare the achievements of these children with scores intended to show what conditions ought to be at the end of a year's work is misleading.

Finally, from an examination of the list of schools from which the standard scores were derived, we cannot avoid the impression that they are all of them much above the average in the point of efficiency. The kind of superintendents and principals who would see Mr. Courtis' announcements in the sort of periodicals that gave publicity to his plans, and who would reply favorably to his invitation to give the tests in

their schools, are by that fact a "selected" group. Their schools are no doubt likewise selected. Three of them, for instance, were tested in New York City, namely, The Horace Mann School, The Ethical Culture School, and The Brooklyn Training School. No one, I should suppose, would think that these schools, at least in regard to the sort of children who attend them, are typical of conditions throughout the city. A comparison of two schools in the Report, one a "foreign," the other an "American" school, shows how the latter surpasses the former in reasoning (p. 104). We are therefore prepared to expect the same superiority—due largely to greater ability to read English—on the part of these seventy schools over the public schools of New York in general with their great numbers of foreign children.

The standards, therefore, are meant to apply to conditions at the end of yearly grades. They were derived from schools probably greatly above the average. Even for these schools they do not stand for conditions as found, but for achievements so excellent that in the eighth grade only 30% of the children were able to qualify. Those who have been saying that the New York schools have been judged by ideal and untried standards will surely find in this good ground for their belief. It is, however, quite unnecessary to reject the standards on this account. There is, of course, nothing objectionable in setting up these standards, provided they are frankly stated to be ideal and untried. In fact, when so defined and applied they ought to be recognized as good standards and worth working for. The misfortune is that false impressions have been created of an inferiority of conditions in New York to conditions elsewhere. The real truth of the matter appears to be that conditions are decisively superior.

I cannot see why the standard scores should any longer be left as they are. When—as in the reasoning tests—marked discrepancies are shown, it is far more probable that the standard in reasoning is set too high than it is that the entire difference is due to the inferiority of the schools tested. We must remember that the standard was derived from less than 10,000 cases. More than 27,000 additional cases have now been reported. The results from the former should not be unin-

fluenced by the results from the latter. In the same way it is probable that the standards in addition ought to be raised. At any rate some revision should take place as a result of the testing in New York.

Based on the standard scores Mr. Courtis has constructed his comparative graph to which reference has been made above. This is an exceedingly valuable device, even though we do not assume that the standard scores on which it is based are finally fixed. They are certainly better than any that anyone else has devised or is soon likely to devise. They should be revised by the author himself, who, I should suppose, would be the last one to think that he had reached finality. They should incorporate the results in New York City.

But to say that the curve of any grade or pupil called "good" will lie wholly within the boundaries of that grade (p. 97) is to restrict that word far too closely. From the individual and grade graphs shown in the report it is clear that very few pupils would qualify for the title "good" under such conditions. They would have to differ, for instance, in the sixth grade as follows:

In Addition by not more than 4 from 50.
In Subtraction by not more than 3 from 36.
In Multiplication by not more than 3 from 37.
In Division by not more than 3 from 37.
In Copying by not more than 7 from 99.
In Speed Reasoning (Att.) by not more than 0.6 from 5.8.
In Speed Reasoning (Rts.) by not more than 0.5 from 5.
In Fundamentals (Att.) by not more than 1 from 11.
In Fundamentals (Rts.) by not more than 0.8 from 6.6.
In Reasoning (Att.) by not more than 0.3 from 3.7.
In Reasoning (Rts.) by not more than 0.3 from 2.8.

To suppose that this is possible except by chance is to suppose that the variability everywhere found in human nature may be counteracted by training to an astonishing degree.

On the whole, however, I regard the Comparative Graph or something like it by which achievement may be visually presented with reference to standards as the most valuable

application which Mr. Courtis has made of his investigations. We may not agree with him as to the fixed nature of his standard scores as shown in the graphs; we may not go all the way with him in regard to the narrow limits of an allowable variability; but we shall maintain that he has presented a practical classroom device for keeping track of children's needs and making plain actual conditions which is more valuable than anything we have yet seen.

I think one of the most unsatisfactory parts of the report is the handling of relationships. In this I think Mr. Courtis betrays a lack of acquaintance with statistical theory or an unwillingness to use it that renders all this part of his report clumsy and inelegant if not actually misleading. The one adequate measure of relationship is the coefficient of correlation. Some one of the well recognized methods of computing such expressions of relationships ought to have been adopted and consistently used. The method of simply plotting the averages of an array is open to a number of objections, one being that the average does not lend itself to this kind of work for the very reason that it tends to obliterate all the deviations from central tendency. No satisfactory statements of relationships can be made which do not take account of all the deviations in the one trait as these are related to all the deviations in the other.

I should treat such tables of relationship as XXVII, p. 85, by first turning them upside down, thereby bringing the zero scores to the top. I should then calculate medians, and express the vertical and horizontal scales as deviations (plus and minus) from the median. The table should then be median-sectioned, and the median ratio found by counting out all those corresponding to $\frac{1}{2}n$. It seems to me that this method would be easier in this instance than the product-moment method and quite as satisfactory. In other tables, such as XXXI (p. 90) and XLIII (p. 131), where only averages in the second trait are given, no very satisfactory expressions of relationships can be derived.

I shall now take up briefly and without attempting a complete discussion several criticisms in addition to those presented above. They cannot be classified under a general heading. They may be regarded as of a miscellaneous nature.

1. In the scoring of the results in Tests 1-4, the method seems to me questionable. These four tests are in table work, one test for each of the four fundamental operations. No record is taken of the number of combinations *correctly* written, but only of the number attempted. The assumption is made that within a margin of error so small as to be negligible the number correct corresponds to the number attempted. Accordingly, if a child writes down twenty, or thirty, or forty answers, he is credited with having them all correct. Mr. Courtis defends this procedure, and gives data to show that when a child attempts to write the result of a combination he is "caught in the grip of a situation" to which he must react correctly if he reacts at all. Instinctively, I think, one who is in direct contact with the classroom will feel that this assumption is not warranted.

Nor is data lacking to support such a feeling. In the "Elementary School Teacher" for September, 1913, is an article by C. L. Phelps on "A Study of Errors in Tests in Adding Ability." The papers of 238 eighth-grade children in San Jose, California, were rated. Each child wrote twenty-five tests in the adding combinations, yielding, therefore, 5950 papers. If any grade of children in the elementary school might be expected more than another to show this automatically correct response to the presentation of the number combinations it would be the eighth or last grammar grade. But this investigation shows (1) that the combinations differed widely in difficulty, and that "a fairly regular increase was found in the number of errors made and in the number of children making them as the combinations increased in size"; (2) that "on certain combinations from a *third* to a *half* (of the children) made mistakes"; (3) that in this study speed and accuracy do not, as Mr. Courtis assumes, show a close positive correlation, but that "the slowest group did the most accurate work and the fastest group made the most errors"; and finally (4) that "the results of this study do not justify the ranking of groups by scoring their speed record without taking into account the errors made in the tests taken."

These conclusions are, of course, based upon the testing of a relatively small number of children in addition alone. They

indicate, however, that the correlation of speed with accuracy is certainly not perfect, and that it is probably not nearly perfect. I suggest that the degree of correspondence be worked out by Mr. Courtis from his abundant material so that when the speed score of a class or school is known and the labor of getting a direct record of accuracy is felt to be too great, an approximately correct record for the latter may be derived from the former.

2. The total failure to take account of the form of distribution of ability, and the consequent misunderstanding of percentage statements has seemed to me unfortunate in the Report. The percentage illusion is one that seems to cling to Mr. Courtis. In a group of papers one set of examples involving no borrowing or carrying were rated 85% correct; another set involving borrowing and carrying were found to be 73% correct. "That examples of approximately the same length," he remarks, "but involving carrying should be practically double the difficulty of the first is a new idea to the writer." (Elementary School Teacher, Vol. II, p. 360.) This is indeed a new idea. The thought is that in the first case the examples are wrong 15% of the time, in the second nearly 30%; and that therefore the latter set is twice as hard as the first. This would be like saying, "John has $15 less than $100 and James has $30 less than $100, therefore, James is twice as poor as John."

3. I cannot help thinking that a form of tabulation which should show the number and per cent. of errors in each problem of Tests 6, 7, and 8 would have been very valuable as a criticism of the test material—much more valuable than criticisms based on "units of work" or reference to an "ideal individual." If these per cent ratings could then have been turned into some unit which should be a function of the variability of the distribution, the result would have been still more valuable. Again, if regard were had for the form of distribution, the data of Table XVII[1] might have been converted into linear amounts in terms of a unit of variability, and the grade intervals might have been expressed. The same sort of data

[1]Per cent. of the children of each grade whose scores exceed or fall below the average score of every other grade. Test 3, Multiplication.

might have been worked up for all the tests using the material of Tables VIII, IX, XII, XIII, VII, and XIV. The number of cases being so great and the tests so numerous, we might thus obtain really valuable information as to grade intervals.

4. Finally, the location of a zero-point of reference is desirable. Tests 1-5 do not need to be supplemented for this purpose. But Tests 6, 7, and 8 are too hard for the purpose. In reasoning, for instance, we should need a test so easy that those who failed to solve any of the given problems might be said to have no reasoning ability. Such a test would then need to be evaluated with reference to Tests 6 and 8 or to a series of reasoning tests. We should then be able to say of a child who did a certain piece of reasoning that he showed twice or three times or one-half the reasoning ability of another child who performed differently.

Our conclusion, then, as to the Report is that in it we have an excellent monograph on individual variability as shown in certain processes of arithmetic, that the tests and methods of giving and scoring them are the best to be had, but that other tests both easier and harder need to be devised and linked together by known relationships. That while in some of the devices and concrete descriptions the Report is excellent, the author does not employ some of the most useful methods of statistical interpretation and that the absence of these detracts materially from the value of the Report. That although the standard scores are very much worth while as devices by which to measure and control conditions and growths, they are not to be regarded as final; and particularly that they ought to be modified as a result of the New York testing. And finally that the Report does not reveal conditions in the City of New York to be worse, but better, than conditions in general elsewhere.

THE BINET-SIMON MEASURING SCALE FOR INTELLIGENCE: AN ANNOTATED BIBLIOGRAPHY. PART I.

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15. BINET, A. *A proposito delle "Ricerche di Psicologia individuale nei Dementi" di Baroncini e Sarteschi.* Rivista di psicol. 1910, 6: 184-185.

A criticism both of the work of these Italian experimenters and the interrogation method of Ferrari.

16. BINET, A. *Comment les instituteurs jugent-ils l'intelligence d'un écolier?* Bull. Soc. libre Etude de l'Enfant 1910, 10: 172-182.

Results show marked inaccuracy in judgments when based on other than sound experiment, training and experience.

17. BINET, A. *Nouvelles recherches sur la mesure du niveau intellectuel chez les enfants d'école.* Année psychol. 1911, 17: 145-201.

A review of the results obtained by the use of the scale in different countries. Presentation of the 1911 revision. Binet's last work on mental tests.

18. BINET, A., ET SIMON, TH. *Mitteilung über die neuen Methoden der Diagnose des Kretinismus, Schwachsinns und mangelhafter Entwicklung.* Eos 1905, 1: 247-251.

19. BINET, A., ET SIMON, TH. *Méthodes nouvelles pour diagnostiquer l'idiotie, l'imbecilité et la débilité mentale.* 5. cong. intern. di psicol. Roma, 1905, pp. 507-510.

A short summary of their method in diagnosing degrees of defect.

20. BINET, A., ET SIMON, TH. *Sur la nécessité d'établir un diagnostic scientifique des états inférieurs de l'intelligence.* Année psychol. 1905, 11: 163-190.

Discussion of the errors made in diagnosing mental defect. A plea for the careful study and classification of symptoms. A short history of the classification of feeble-minded. The proposal of a scheme for "psychological classification."

21. BINET, A., ET SIMON, TH. *Méthodes nouvelles pour le diagnostic du niveau intellectuel des anormaux.* Année psychol. 1905, 11: 191-244.

For the first time a scale consisting of thirty tests is proposed to measure intelligence. Compared to the "medical and pedagogical methods," the "psychological" is chosen as the most direct and giving the best results.

22. BINET, A., ET SIMON, TH. *Application des méthodes nouvelles au diagnostic du niveau intellectuel chez des enfants normaux et anormaux d'hospice et d'école primaire.* Année psychol. 1905, 11: 245-336.

After expounding the theory they proceed to prove it. Their results are arranged according to group, test and reactions at each age level. The remarkable value of the scale is proven, although some changes need to be made.

23. BINET, A., ET SIMON, TH. *Le développement de l'intelligence chez les enfants.* Année psychol. 1908, 14: 1-94.

Having gained a deeper insight into the evolution and development of intelligence, the authors revised their old scale and added new tests, arranging the questions according to mental age. Over three hundred children were examined in order to verify each test. The results as well as the individual tests are thoroughly discussed.

24. BINET, A., ET SIMON, TH. *Langage et pensée.* Année psychol. 1908, 14: 284-339.

The possibility of a heirarchy of tests into adulthood.

25. BINET, A., ET SIMON, TH. *L'intelligence des imbéciles.* Année psychol. 1909, 15: 1-147.

26. BINET, A., ET SIMON, TH. *Nouvelle théorie psychologique et clinique de la demence.* Année psychol. 1909, 15: 168-272.

Some interesting results obtained from the application of the scale to dements.

27. BINET, A., ET SIMON, TH. *La mesure du développement de l'intelligence chez les jeunes enfants.* Bull. Soc. libre Etude pschol. de l'Enfant. 1911, 11: 187-256.

The 1911 revision of the 1908 scale with thorough instructions for its use. Three important changes made.

28. BLOCH, E., UND LIPPA, H. *Die Intelligenzprüfungsmethode von Binet-Simon (1908) an schwachsinnigen Kindern.* Zsch. f. angew, Psychol. 1913, 7: 397-409.

Forty-one boys and thirty girls, eight to fifteen years. Tables and results. Satisfied with the scale as a means of grading intelligence.

29. BLOCH, E., UND PREISS, A. *Uber Intelligenzprüfungen an normalen Volksschulkindern nach Bobertag. (Methode von Binet und Simon.)* Zsch. f. angew, Psychol. 1912, 6: 539-547.

Seventy-nine boys and seventy-six girls. Bobertag's results substantiated and criticised. Satisfied with the scale.

30. BOBERTAG, O. *A. Binet's Arbeiten über die intellektuelle Entwiklung des Schulkindes. (1894-1909.)* Zsch. f. angew. Psychol. 1909, 3: 230-259.

An excellent summary of Binet's work on intelligence tests. He traces carefully the development of Binet's thought on the problem of measuring mentality.

31. Bobertag, O. *Neure Arbeiten über Intelligenzprüfung.* Zsch. f. angew. Psychol. 1911, 5: 204-210.

A critical review of five articles.

32. Bobertag, O. *Intelligenzprüfungen an Schulkindern.* Die Grenzboten 1911, 70: 375-384.

33. Bobertag, O. *Uber Intelligenzprüfungen (nach der Methode von Binet und Simon).* Zsch. f. angew. Psychol. (A) 1911, 5: 105-203; (B) 1912, 6: 495-537.

(A) A psychological analysis and statistical study of the Binet-Simon tests. Over four hundred cases examined. Criticisms and suggestions.

(B) The author here continues his article, but dwells more on the statistics of his experiment.

34. Bobertag, O. *Quelques réflexions méthodologiques à propos de l'échelle métrique de l'intelligence de Binet-Simon.* Année psychol. 1912, 18: 271-287.

He emphasizes some of the fundamental principles to be kept in mind both in giving the tests and in evaluating the results.

35. Bobertag, O. *Kurze Anleitung zur Ausführung der Intelligenzprüfung nach Binet und Simon.* Instit. der Gesellsch. f. exper. Psychol. 1913, Nr. 8.

The scale in German.

36. Borertag, O. *Neure Arbeiten zur Intelligenzprüfung.* Zsch. f. angew. Psychol. 1913, 8: 154-166.

A review and criticism of twenty-four recent articles.

37. Boehne, G. M. *Regarding Special Classes for Sub-normal Children.* J. Psycho-Asthen 1912, 17: 20-28.

The use of the scale for grading the backward and feeble-minded. (Discussion by Goddard.)

38. Bridgman, O. *Mental Deficiency and Delinquency.* J. Am. Med. Assoc. 1913, 61: 471-472.

Out of one hundred and eighteen State Training School inmates eighty-nine per cent were found to be mentallly defective.

39. Bruner, F. G., Barnes, E., Dearborn, W. F. *Report of the Committee on Books and Tests Pertaining to the Study of Exceptional and Mentally Deficient Children.* Pro. Nat. Educ. Assn., Denver, Colo., 1909, pp. 901-914.
An outline of the tests.

40. Burt, C. *Experimental Tests of General Intelligence.* Brit. J. of Psychol. 1909, 3: 94-177.
Some of the tests are the same as those used by Binet.

41. Call, A. D. *Dr. Dawson's Inductive Study of School Children.* Psychol. Clinic 1912, 6: 61-68.
Among others the Binet tests are used for diagnosis.

42. Chase, H. W. *Work with the Backward and Sub-Normal in the Children's Institute.* Ped. Sem. 1910, 17: 189-203.
The question of tests discussed.

43. Chotzen, F. *Die Bedeutung der Intelligenzprüfungsmethode von Binet und Simon für die Hilfsschule.* Hilfsschule 1912, 5: 153-162.
A summary of the results obtained by Bobertag in his use of the Binet tests. The scale valuable because of its ability to give a rapid diagnosis.

44. Chotzen, F. *Die Intelligenzprüfungsmethode von Binet-Simon bei schwachsinnigen Kindern.* Zsch. f. angew. Psychol. 1912, 6: 411-494.
Two hundred and eighty cases, ages seven and a half to fourteen. Tables and curves. A critical review of each test. Sex differences noted. In concluding he insists upon the great value of the scale.

45. Cords, R. *Die Farbenbenennung als Intelligenszprüfung bei Kindern.* Zsch. f. päd. Psychol. 1910, 11: 311-314.
Confirms the accuracy of the Binet color test.

46. Cornell, W. S. *Health and Medical Inspection of School Children.* Phila.: Davis, 1912.
An exposition of the scale as used by Goddard. Believes that physical defects can retard a child for two or three years.

47. Cruchet, R. *Les tests de Binet dans le tout jeune âge.* J. de méd. de Bordeaux 1912, 42: 17-32.
The tests for the lower ages are too few.

48. D'Allonnes, G. R. *L'affaiblissement intellectuel chez les déments.* Paris: Alcan, 1912, pp. 288.

Thirty cases examined. The method employed was similar to that of Binet-Simon in their "Nouvelle théorie de la démence."

49. Davenport, C. B. *Heredity in Relation to Eugenics.* New York: Holt, 1911, pp. 65-72.

The inheritance of defective mentality as determined by the scale.

50. Decroly, O. *Intelligenzmessungen bei normalen und abnormen Kindern.* 2. Kongr. exper. Psychol. Würzburg, 1906, pp. 187-193. Leipzig: Barth, 1907.

A very close correspondence is noticed between the mental age, as found by the Binet scale, and other mental and physical manifestations.

51. Decroly, O. *Classifications des enfants irréguliers et en particulier des irréguliers scolaires.* 6. Congr. Intern. de psychol. Genève, 1909, pp. 359-393.

The Binet scale is most simple and practical.

52. Decroly, O. *L'examen des délinquants juvéniles.* 3. Congr. intern. de Neurol. et Psychiat. Bruxelles, 1913.

53. Decroly, O., et Boulenger. *Les tests mentaux chez l'enfant.* 2. Congr. de Neurol. Bruxelles, 1907.

54. Decroly, O., et Degand, J. *Les tests de Binet et Simon pour la mesure de l'intelligence: contribution critique.* Archiv. de Psychol. 1906, 6: 27-130.

Most of the cases psychopathic. Each child's reaction noted.

55. Decroly, O., et Degand, J. *Le mesure de l'intelligence chez les enfants. 2. contribution critique. La méthode de DeSanctis.* Archiv. intern. d'hyg. scaloire. 1904, 4: 230-303.

Twenty-nine cases. Binet and DeSanctis closely compared.

56. Decroly, O., et Degand, J. *La mesure de l'intelligence chez des enfants normaux d'après les tests de MM. Binet et Simon. Nouvelle contribution critique.* Archiv. de Psychol. 1910, 9: 81-108.

An examination of forty-five normal children, two and a half to three years of age chronologically. Results, criticisms and conclusions. They suggest eliminating certain tests which are affected by home training or environment, and advocate changing thirty of the sixty-five tests.

57. DeSanctis, S. (*a*) *Types et degrés d'insuffisance mentale.* Année psychol. 1906, 12: 70-83. (*b*) *Typen und Grade mangelhafter geistiger Entwicklung.* Eos. 1906, 2: 97-115. (*c*) *Tipi e gradi d'insufficienze mentale.* Annali di Neurologia. 1906.

Not believing in Binet's 1905 scale, he devises a series of six tests with which to determine the grade of intelligence.

58. DeSanctis, S. *Les enfants anormaux.* 1. Congr. intern. de Pédol. Bruxelles, 1911.

He recommends the Binet scale, but states that in order to properly treat the child we must not only know the degree of mental defect, but we must also determine his particular mental type.

59. DeSanctis, S. *Mental Development and the Measurement of the Level of Intelligence.* J. of Educ. Psychol. 1911, 2: 498-507.

He finds scale satisfactory for the grading of normal and atypical children.

60. DeSanctis, S. *Lo sviluppo psichico e la misura del livello intellectuale.* Infanz. anormale. 1912, 6: 33-41.

61. DeSanctis, S. *Reattivi per la misura dell' insufficienza mentale.* Contrib. psicol. 1912, 1: 16- .

62. DeSanctis, S., e Jeronutti, A. *Applicazione della "Scala metrica intelligenza" di Binet e Simon e dei "Reattivi" di Sante deSanctis.* 6. Congr. intern. de phychol. Genèva, 1909, .: 775-778.

See Jeronutti. (Discussion by Decroly.)

63. Descoeudres, A. *Les tests de Binet et Simon et leur valent scolaire.* Archiv. de Psychol. 1911, 11: 331-350.

Applied to twenty-four school children. Some conclusions.

64. Descoeudres, A. *Exploration de quelques tests d'intelligence chez des enfants anormaux et arriérés.* Archiv. de Psychol. 1911, 11: 351-375.

With the aim of further completing the Binet-Simon scale, Descoeudres suggests fifteen tests, six of which are already Binet's. Fourteen backward and feeble-minded cases are tested, aged six to fourteen. The results show a high correlation.

65. Doll, E. A. *Mental Tests at the Mental Hygiene Congress.* Traing. School. 1913, 9: 138-139.

Exhibition testing at the Fourth International Congress on Hygiene and Demography. Twenty-four cases. Results.

66. Doll, E. A. *Inexpert Binet Examiners and their Limitations.* J. of Educ. Psychol. 1913, 4: 607-609.

Trained assistants in institutions for the feeble-minded are just as much, and sometimes even better qualified than clinical psychologists to give the Binet test. Stern's mental quotient may be misleading unless the results are those of children of the same age.

67. Dougherty, M. L. *Report on the Binet-Simon Tests Given to Four Hundred and Eighty-three Children in the Public Schools of Kansas City, Kansas.* J. of Educ. Psychol. 1913, 4: 338-352.

Compared to Goddard's earlier study, there are quite a number of variations. Some changes are suggested. Finds the scale valuable.

68. Down, R. L. *Nomenclature and Classification.* Nat. Conf. Preventn. of Destitutn. London, 1911. London: King, 1911, pp. 555-566.

Six of Binet's tests employed.

69. Dresslar, F. B. *School Hygiene.* New York: Macmillan, 1913, pp. 302-312.

Advises the use of the scale by the trained teacher.

70. Dumville, B. *A Trial of Binet's Tests on Five-year-olds.* J. of Exper. Pedag. 1913, 2: 113-118.

The tests from five to eight inclusive were applied to eighty-nine children. The questions seem too easy and as they now stand are unsuitable for accurate diagnosis.

71. Editorial. *The Problem of the Feeble-minded among Immigrants.* J. Amer. Med. Assoc. 1913, 60: 209-210.

Inspection by experts at the port of entry will result in a much larger percentage of defective immigration being detected.

72. FARRELL, E. E. *An Analysis of Dr. Goddard's School Inquiry Report on Ungraded Classes.* 15. Ann. Rpt. City Supt. Schools, New York City. Bd. of Education, Dec. 10, 1913, pp. 65-79.
Criticism of Goddard's Binet examination.

73. FERNALD, G. M. *The Use of the Binet-Simon Scale with Delinquent Children.* 4. Intern. Cong. School Hyg. Buffalo, 1913.
The examiner meets with a great number of difficulties in applying the tests to children from poor environments.

74. FERRARI, G. C. *Come si misura lo sviluppo dell' intelligenza nei bambini normali.* Rivista di psicol. 1908, 4: 465-471.
The Binet-Simon 1908 scale in Italian.

75. FERRARI, G. C. *Les arriérés scolaires.* 6. Congr. de psychol. Genève, 1909, pp. 399-422.
The study of mental types has been found valuable by the clinician.

76. FRANCIA, G., E FERRARI, G. C. *L'esame psicologico sommario dei deficenti.* Rivista de psicol. 1912, 8: 269-288.
A review and criticism of Mlle. Giroud's work.

77. FRANZ, S. I. *Handbook of Mental Examination Methods.* J. of Nerv. and Ment. Dis. Publ. Co. 1912, pp. 165.
A large number of the Binet tests mentioned.

78. FRASER, K. *The Use of the Binet-Simon Tests in Determining the Suitability of a Child for Admission to a Special School.* School Hygiene. 1913, 4: 77-88.
Some very interesting returns from the Summerton Special School.

79. FREEMAN, F. N. *Tests.* Psychol. Bull. 1912, 9: 215-222.
A resume of recent literature.

(Continued in the May number.)

COMMUNICATIONS AND DISCUSSIONS.

THE WEIGHT OF FOOT-BALL MEN BEFORE AND AFTER PRACTICE.

A study of a number of our college foot-ball men has been made recently with the object of determining, if possible, what is the normal loss in weight of an athlete in training in ordinary daily practice. With this object in view a careful record of the weights of the members of the foot-ball team has been made and charted. In the diagrams the weights are placed in a vertical column at the left of the chart, and the time intervals are represented in the horizontal line at the base. The continuous heavier line from circle to circle shows the weight before practice. The lighter dotted line shows the weight after practice. The distance between these lines is the differences in pounds before and after practice.

The diagrams here presented represent actual conditions and the individuals selected show the variety of conditions found. The

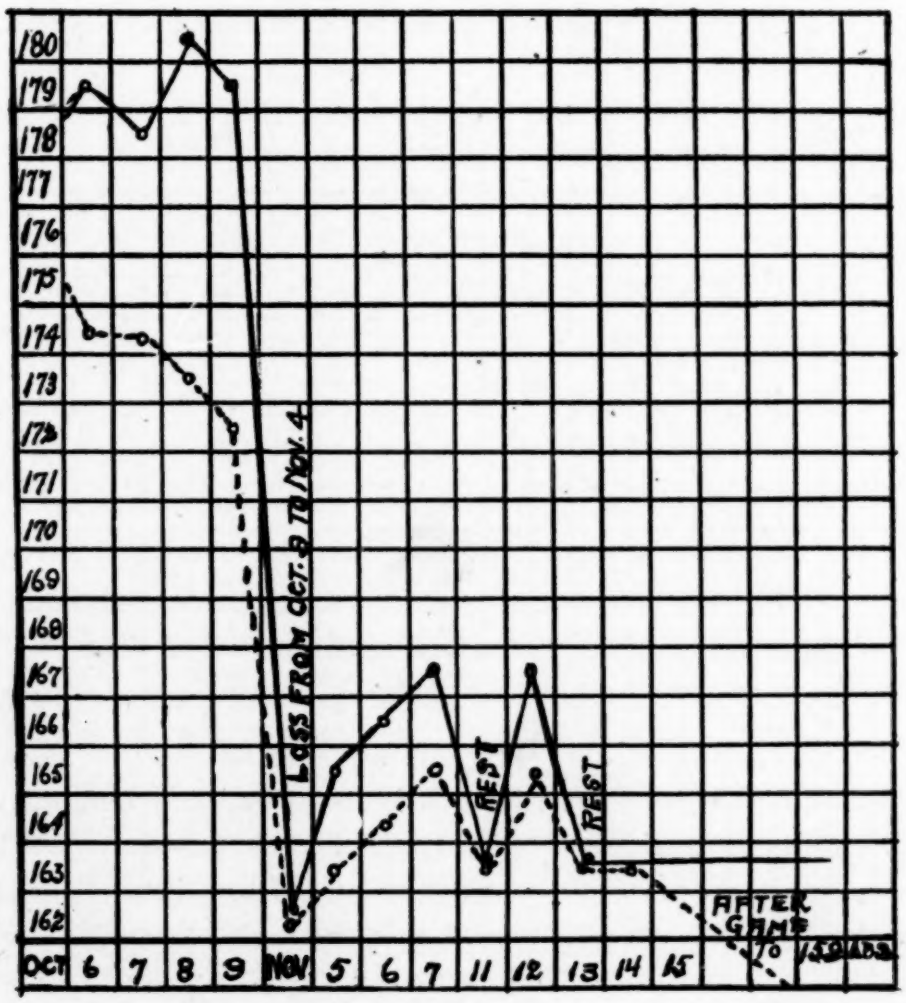

Figure I.

environment and habits of these men in regard to balanced diet, uniform sleep and exercise were under good control.

The captain of the team (I), twenty-four years of age returned to college in poor physical condition. He was determined to train and get into good health but failed utterly. At the beginning of practice his heavy line shows a daily increase in weight due to regular hours for meals and wholesome food; since during the summer, while traveling from place to place, he had irregular periods for meals and improper kinds of food. His curve of weight before practice unfortunately deviated from that after practice until the difference finally reached seven pounds. At this point there was a complete physical breakdown, due largely to lack of reserve nerve force. At the end of three weeks when he returned to practice again it was found that his curve for the weight before practice had dropped from 179 to 163 pounds. For a few days there was a gradual increase and by a combination of rest and work he was permitted to take part in the last game of the season which he played throughout.

Figure II.

The second example (II) (twenty-one years of age) shows a superior condition where both curves increase with a constant difference. Starting practice at 183 pounds he increased to 189 and nowhere do the two curves show a difference of less than two nor more than four pounds, except where a slight injury interfered with heavy practice. He played through the entire season.

The next diagram shows a condition directly opposite to the one above. The person represented (III) is twenty-one years of age, is

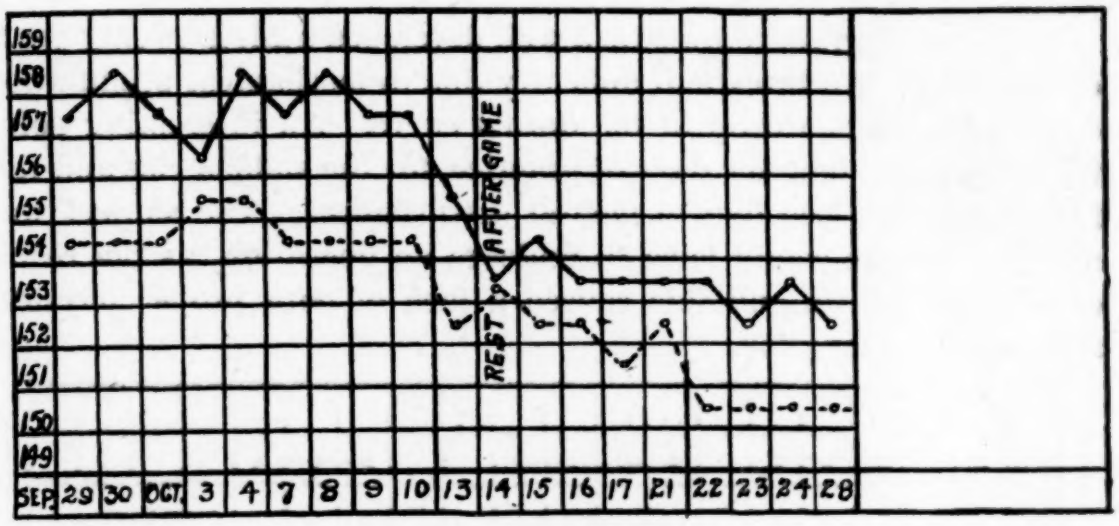

Figure III.

an advocate of no meat diet and very seldom uses it even under the most severe training. In addition to his foot-ball ability he is a varsity track man. The decreases shown in these curves would be alarming if it were not for the fact that they maintain a constant difference with a total loss during the season of only about six pounds. To determine the cause for the loss in weight his diet was studied and it was found to contain the correct food properties. Inquiries concerning his habits showed that these were normal. It was concluded that the loss was due to adipose tissue. The diagram seems to support this view, since during the first hard game there was a loss of four pounds, which was not regained during the season. After this loss, however, the curves fluctuated in only two points and the difference was as little as one pound.

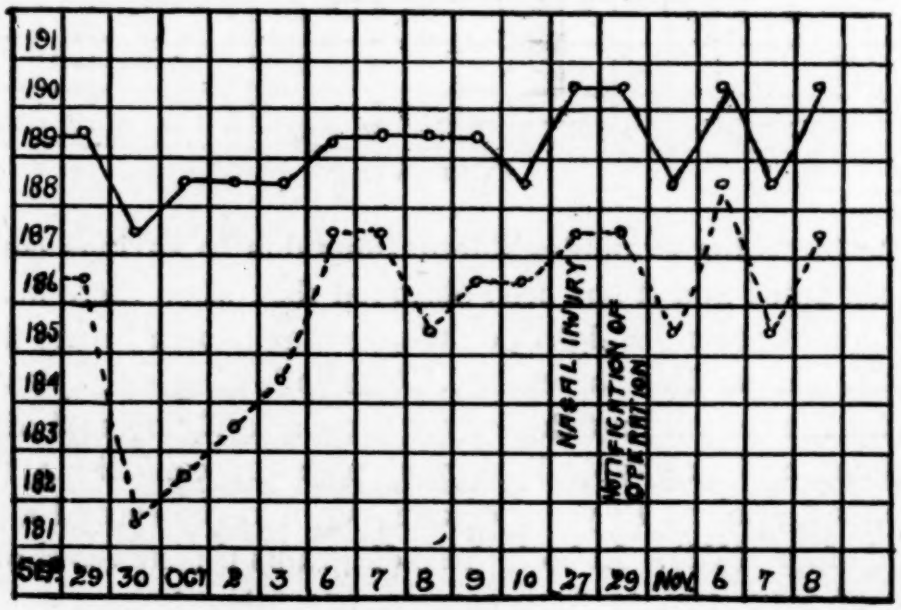

Figure IV.

The next diagram represents a well developed athlete twenty years of age (IV). An intestinal difficulty due to mechanical stimulation caused the sudden drop in the dotted curve. An interesting point is shown in the last few days of practice, for the sudden rise and fall in both curves was due to mental disturbances. The subject was notified that he would have to undergo an operation, as the result of a nasal injury, and this caused a lack of both proper physical and mental relaxation.

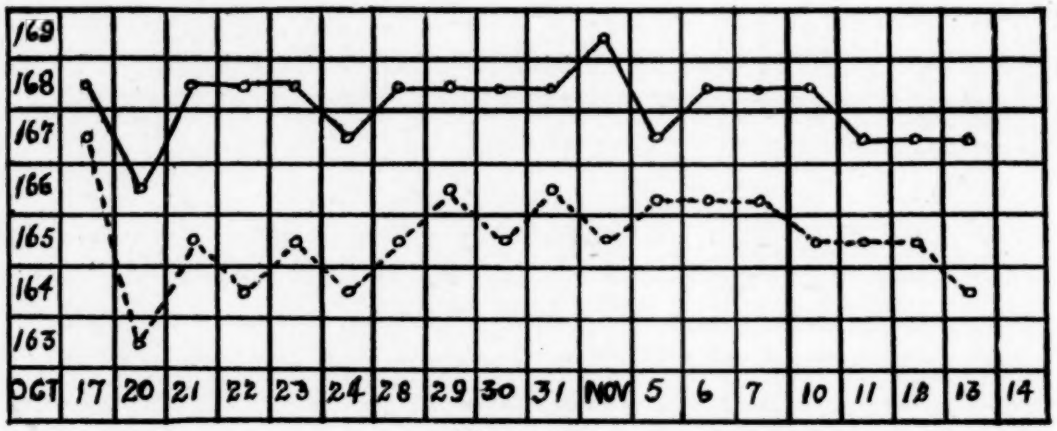

Figure V.

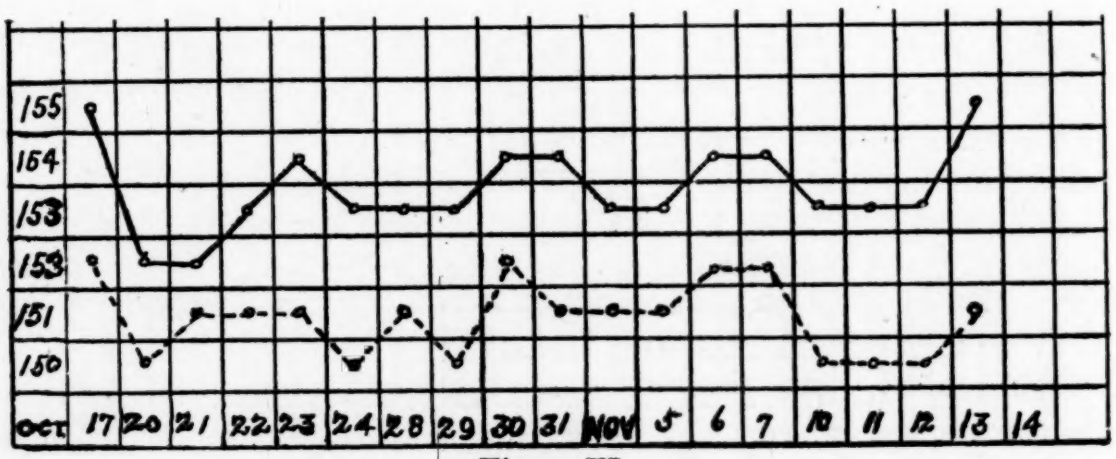

Figure VI.

In the foregoing examples fluctuations due to various conditions have been noted and it has been observed that when there is a difference of about seven or eight pounds, as was shown in the first diagram, the danger line is reached. The following examples are selected for the reason that the curves show a fairly normal difference throughout and are typical of good physical condition; the first represents a student 19 years of age (V) and the second a student 20 years of age (VI). In both these diagrams the curves show a difference of from two to four pounds, excepting in one or two in-

stances where the difference was less than two pounds, but increased to two or more the next day.

It may be tentatively concluded from these observations on a group of foot-ball men and from a comparative study of the six types of individuals included in this brief report that conditions may be considered normal when the difference is no greater than four nor less than two pounds, providing the increase or decrease of both curves is gradual and parallel. There may be a slight fluctuation beyond these points if there is an immediate return to this limit. The heavy curve is a good index of the physical and nervous condition of the individual.

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CONFERENCE OF COLLEGE TEACHERS OF EDUCATION OF THE MIDDLE WEST.

The third annual conference of College Teachers of Education of the Middle West was held at the Rome Hotel, Omaha, Nebraska, December 26th and 27th, 1913.

The morning period of the first day was given over to an informal discussion of certain phases of practice teaching. The first regular session was opened at 2:00 P. M. by Dean Charles Fordyce, of the University of Nebraska, chairman of the Conference. The topic for the afternoon, "What subjects should appear in the curriculum of the School of Education and how should the time be allotted among these?" was presented by Professor H. H. Foster, of Ottawa University, and by Professor G. M. Wilson, of the Iowa State College. Professor Foster said in brief:

"The content and organization of the undergraduate course in Education are determined by three considerations: (1) In most colleges and universities, about eighty per cent of the Education graduates become high school instructors, and most of the remainder high school principals or village superintendents. (2) The regular course in Education for the great majority of students must not exceed fifteen or eighteen hours of college work. (3) The teaching staff is usually too small to permit of a great variety of highly specialized courses, except at the expense of fundamental work. A questionaire shows that teachers value the most highly courses in Educational Psychology, General Methods and Practice Teaching, with recommendations that in all the work in Education the practical

application of principles be made clear and prominent. Special Methods courses seem to be of little value, in most cases. These conditions and needs suggest that the undergraduate training in Education include the following courses: Educational Psychology three hours, History of Education three hours, Secondary Education three hours, Principles of Education three hours, and a five hour course in Secondary Methods, Observation, and Practice Teaching. For administrators, a course in School Administration, of possibly two hours, should be added. A concerted effort toward a standardization of nomenclature in Education courses is urgently needed." Along the same line Professor Wilson said:

"At the outset it is well to recognize the fact that the majority of our students have not taught and desire the minimum of work in education that will enable them to secure state certificates. What shall the minimum requirement be?

"A recent study which I made among the superintendents of schools in Minnesota as to the time in education for prospective teachers of agriculture indicated a range, in opinion, from 10 to 30 hours, with from 16 to 20 as the mode and the median. It is most significant that the teachers of agriculture themselves, most of whom have had no work in education, without exception indicated the desirability of work in education, the median and mode being 15 hours.

"The next question to arise is how shall this 15 or 20 hours be apportioned among the several lines of possible work in education? Evidently there should be work in three lines, viz., basis science, applied science or professional theory and technique, and opportunity for application under guidance. I therefore propose that the 15 or 20 hours be divided as follows:

¼ time, (basis science) educational psychology.
½ time, (professional technique) Observation and Methods.
Methods of Special subjects.
¼ time, (application under guidance)
Practice teaching, including organization and evaluation of subject matter.

"This minimum requirement omits work in general psychology and in the history of education. These are very valuable but they

do not function so directly, and are reserved for the advanced student in education.

"The educational leader must have advanced courses in education, and his work should include in addition to the 20 hours expected in the undergraduate course, courses about as follows:

General psychology	5 hrs.
Advanced educational psychology	5 hrs.
History of education	10 hrs.
Elementary education or Secondary education or School administration	10 hrs.
Educational sociology	5 hrs.

"This gives us a good balanced ration. But if the advanced student must choose, he should take the more practical work."

This topic aroused perhaps the liveliest discussions of the whole meeting. The necessity for the standardization of education courses in both name and content was so evident that the Conference appointed a committee to investigate the matter and report at the next meeting. This committee consists of: G. M. Wilson, Iowa State College; W. F. Jones, University of South Dakota; and G. W. Luckey, University of Nebraska.

At the evening session of the 26th, Professor F. E. Howard, of Nebraska Wesleyan University, spoke on certain pressing problems for college departments of Education.

"There is a lack of professional spirit among college trained high school teachers. In this respect they are inferior to elementary teachers trained in normal schools. College department of education should strive to remedy this weakness by creating a better craft spirit and giving a broad social view of teaching as a type of social service.

"High school teachers as a class fail to appreciate the pedagogical significance of the vocational motives of adolescence, and hence are not qualified to meet the problems of vocational guidance. The colleges must aid the secondary schools by training some specialists in this line and by giving all prospective high school teachers the vocational point of view."

There was considerable discussion as to whether or not high school teachers have less professional spirit than elementary school teachers. Opinion seemed to be quite evenly divided. Undoubtedly there is frequently seen in the high school teacher who has had professional training in the university or college, the attitude of having "finished" her work of preparation. Possibly this attitude exists more frequently than in elementary teachers who have usually completed only a two-year normal school course.

The topic for the morning session of the 27th was: "How can the department of Education aid in the solution of the problems confronting public school education?" Professor W. F. Jones, of the University of South Dakota, opened the discussion by presenting the results of a series of elaborate investigations on the teaching of spelling. The necessity of reducing the number of words in the spelling book and of developing a spelling vocabulary based upon the needs of pupils in the different grades was emphasized. The results of these investigations may be found in a bulletin recently issued by the University of South Dakota.

In connection with the general topic for the morning, Professor E. E. Lewis, of the State University of Iowa, discussed briefly the necessity for vocational training and vocational guidance. "The problem of vocational education and vocational guidance is a problem that departments of education in the various institutions can no longer refuse to consider. It is a very old and a very large problem, and the wonder is that it has so long been overlooked by professional workers in education. The public schools are affected by the movement. From every quarter comes the cry 'revise', 'cut-out', 'add', 're-organize'. School superintendents and principals are bewildered. They do not know what to do. They journey to Wisconsin, to Massachusetts, to Europe, only to find themselves even more bewildered by what they hear and see. They come back feeling that they must do something to meet the 'demand' so they imitate the example they have seen hardly knowing what they do. In fact, there is nothing else for them to do. To whom can they turn for knowledge, advice, and direction if the professional teachers of education continue to turn their backs upon this problem? Schools of education should, wherever possible, offer a general course in vocational education to help these superintendents. Such a course should cover the history of vocational education, current examples

of vocational education, the literature of vocational education, and the many allied problems. Short courses in vocational guidance should be given to help teachers and principals in their work of directing youths into more suitable and profitable employments. Is it not as much the function of a school of education to direct modern thought and tendencies as it is to interpret the past?"

Professor J. E. Butterworth, of the University of Wyoming, mentioned certain ways in which departments of Education may aid in solving public school problems: investigation work of the functional sort by faculty members, by advanced students, and by properly prepared teachers and officials in the public schools; special conferences of, for example, high school principals, city superintendents, school boards, history teachers, etc.; extension work through correspondence courses, special classes in accessible centers, visiting consultors of various types. The need of a more coöperative spirit between school officials and members of departments of Education was also mentioned.

In the afternoon of the 27th, Professor Luckey, of the University of Nebraska, who had recently returned from a visit to Germany, discussed certain phases of educational work in that country.

The unanimous expression of opinion was that the meeting was most profitable, and that it filled a real need of educationists of the Middle West. Kansas City, Kansas, was selected as the next meeting place; the time of meeting is to be determined by the executive committee. Arvin Olin, of the University of Kansas, was chosen chairman; J. E. Butterworth, of the University of Wyoming, secretary.

J. E. BUTTERWORTH, Secretary.

University of Wyoming.

THE
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EDITORIAL.

THE VERMONT SURVEY.

The careful student of existing educational institutions cannot fail to be impressed with the lack of well-planned articulation between the various stages of our educational activities, and with the apparent disregard of the broader interests of the youth for whose welfare the institutions exist. Our schools have grown up at hap-hazard in response to local and temporal needs, and give little evidence of consistent reflective policy. It is a part of the movement for the scientific study of education to subject these badly organized agglomerations of pupils to a critical scrutiny, to set forth their strong points, to reveal their weaknesses, and to point out such feasible changes as will insure their coherence and usefulness. This is the service which the numerous "school surveys" are now rendering their communities and the general public, and the results are having an increasing influence on legislative enactments. The study of *Education in Vermont,* recently issued by the Carnegie Foundation for the Advancement of Teaching, is of especial interest, in that it is the first comprehensive survey of all the educational activities of a state. All types of schools—elementary, secondary, normal, collegiate and graduate—receive due consideration from the standpoint of the needs of the younger generation and of society. It is noteworthy that the Foundation, heretofore chiefly interested

in higher education, takes a decided stand in favor of the development of elementary and secondary education along vocational and industrial lines, urges the establishment by the state of adequate training courses for teachers, and recommends the withdrawal of state aid from the higher institutions.

The claim is made that the education offered in the past has been such as to induce young people to emigrate from the state rather than to fit themselves to remain in it and to become active factors in the state's prosperity. The work of the schools is too formal, too rigorously dominated by the traditional demands of college entrance requirements. It is dry, monotonous, and forbidding, with no adjustment to economic needs or to the tastes and prospects of individual pupils. All the resources of the state should be concentrated on the establishment of an efficient system of administration and supervision, on a more thorough training for teachers, on a richer and more varied elementary school curriculum, and on the reorganization of secondary education. The work of the seventh and eighth grades should be combined with that of the first two years of the high school in schools that have only a few teachers, and these four-year courses should be called "junior high schools." In addition there should be established eighteen or twenty regional, central high schools, with a full six-year course (including grades seven and eight), and with provisions for boarding and lodging those graduates of the junior high schools who live too far from the central high school to make the journey every day. In this way more elementary pupils would be encouraged to go on into the high school, the large number of pupils who do not desire to pursue their studies further would be cared for by the local junior high school, and the per capita expenditure for the later secondary years would be materially decreased. At the same time with better trained teachers and with fewer demands made on them, the evils of the textbook recitation would be diminished, there could be greater diversification in the courses offered, and more account could be taken of the needs and capacities of individual students. By these means the state would establish a consistent, well-articulated system of elementary and secondary education, and would lay such an educational foundation that those who are economically and mentally able, and whose tastes lie in that direction, would go on to college and university in greater numbers and with far better preparation than at present.

J. C. B.

NOTES AND NEWS.

The department of kindergarten education of Teachers' College, Columbia University, announces a report of its recent experimental studies in kindergarten work. The report contains contributions from Miss Luella Palmer, assistant director of kindergartens in New York City; Miss Meredith Smith and Miss Grace L. Brown, of the department of kindergarten education of the College, and Miss Julia Wade Abbott, head of the kindergarten training department of the Winona State Normal School.

According to the daily press, Dr. Leonard P. Ayres, of the Russell Sage Foundation, has recently completed an interesting investigation of 22,027 thirteen-year-old boys living in cities of from 25,000 to 200,000 inhabitants. One-half of these boys were in the sixth grade or below, and large numbers of them will probably leave school and go to work before finishing the elementary grades. Data were secured regarding the occupations of these boys' fathers. Only half of them were employed in industries of transformation, *i. e.*, building trades and manufacturing. Hence vocational training based on these industries alone would be far from affording adequate preparation for the life work of all boys. As many of the fathers were engaged in professional work as in unskilled labor. The group of managers, superintendents and proprietors is practically as large as that of semi-skilled laborers. Mental workers constitute more than one-third of all the workers. Such studies as this are needed to furnish a foundation for our convictions on vocational education.

It is gratifying to note that the work of the Department of Educational Research of New Orleans, under the direction of Dr. David Spence Hill, is receiving increasing recognition. The Commissioner of Corrections, Mr. Lafaye, has requested the department to conduct an investigation and make a report on the care and treatment of delinquent boys. Dr. Hill is making an extended individual study of the boys now detained, using psychological tests, medical examinations, and social studies of the environment, and will visit the leading institutions of the country for the purpose of making a comparative survey of methods of dealing with delinquents.

Through the co-operation of the estate of the late Dr. C. Annette Buckel of Oakland, a research fellowship for the study of feeble-minded children has been established at Stanford University. The department of education, under the direction of its head, Professor E. P. Cubberly, will have the appointment of the fellow, who will work in co-operation with Professor Lewis M. Terman. The first appointment will be for the academic year 1914-15. This is the first foundation for this sort of work in any California university.

Dr. Buckel was an Oakland physician and was widely known for her charitable work in Oakland and for her interest in feeble-minded, backward and delinquent children. On her death her estate was left in trust to Miss Charlotte S. Playter of Piedmont and the money was to be used to advance the condition of backward and feeble-minded children. Miss Playter has turned the money over to Stanford. The income amounts to about $500 a year, and the board of trustees of the university have added an additional $500 to the fellowship. It is hoped to increase this sum so as to make possible a thorough and constructive study of the whole problem of mental deficiency.

Teachers' College, Columbia University, announces a new course for next year on the psychology and treatment of exceptional children. The course will be given Saturday mornings under the direction of Professor Norsworthy and Dr. Bisch.

On April 8th the former pupils of Professor James McKeen Cattell gathered at Columbia University to celebrate his completion of twenty-five years as professor of psychology. With very few exceptions all those who continued work in psychology so as to receive the degree of Doctor of Philosophy were present. At a dinner in the evening Professor Cattell was presented with a Festschrift in the form of reviews of his researches and of work in psychology to which these have lead. The contents of this volume are as follows:

Professor Cattell's Work on Reaction Time,
V. A. C. Henmon.
Professor Cattell's Studies of Reading and Perception,
Walter F. Dearborn.
Professor Cattell's Relation to the Association Method,
F. Lyman Wells.
Professor Cattell's Psychophysical Contributions,
R. S. Woodworth.
Professor Cattell's Studies by the Method of Relative Position,
H. L. Hollingworth.
Professor Cattell's Relation to the Study of Individual Differences,
E. L. Thorndike.

On April 6-8, 1914, the department of psychology of Columbia University held a Conference on Individual Psychology in which former pupils of the department participated. Sessions were devoted to individual differences in sensory discrimination and reaction, individual differences in children, studies of intelligence, psychological studies and vocational guidance, and studies in abnormal deviations. A more detailed account of the conference will appear in a subsequent issue.

The faculty of the Ohio State University has officially adopted a list of 176 simplified spellings for use in all of its publications. This is the fourth institution to adopt some form of simplified spelling. The others are Reed College, Northwestern University, and the University of Illinois.

At Harris Teachers' College, St. Louis, three series of extension lectures have been given this winter. Dr. F. J. Gould, lecturer and demonstrator for the Moral Education League, London, England, delivered four lectures with demonstrations on moral education; Professor J. E. W. Wallin, University of Pittsburgh, gave three lectures on clinical methods in dealing with backward children, and Professor G. D. Strayer, Teachers' College, Columbia University, gave six lectures on school administration, school measurements, and school influence.

The Yale University Press announces a forthcoming book by Dr. J. E. Wallace Wallin, University of Pittsburgh, on *The Mental Health of the School Child*. The sub-title of the book is Contributions to a New Science of Orthophrenics and Orthosomatics.

Professor W. V. Bingham of Dartmouth College is on leave of absence for the second semester, and is spending the time in travel and study in Europe. He will return to Dartmouth for the summer session, of which he retains the directorship. Among the visiting instructors at Dartmouth this summer will be Dean W. C. Ruediger, Teachers' College, George Washington University, and Superintendent D. A. Bardwell, of the New York City High Schools.

Dr. Harry L. Hollingworth, instructor in psychology, Barnard College, has been advanced to an assistant professorship in that institution.

The second semester of the International Faculty of Paidology, at Brussels, opened March 1 with an interesting list of courses, including the psychology and pedagogy of abnormal and backward children, by Dr. Boulenger, visual hygiene, by Dr. Van Lint, aural hygiene, by Dr. Collet, infantile sociology, by Mr. Varendonck, the psychology of testimony, by Mr. Varendonck, and several courses in paidology and experimental didactics by Dr. Ioteyko and Miss V. Kipiani.

The Wellesley College calendar for 1913-1914 shows a notable addition to the instruction offered in the department of education. Three new courses in kindergarten practice and elementary education have been established. Mount Holyoke College also announces a course in experimental pedagogy.

PUBLICATIONS RECEIVED.

(Notice in this section does not preclude a more extended review.)

Addresses and Proceedings of the National Education Association. Fifty-first Annual Meeting, Salt Lake City, Utah, July 5-11, 1913. Ann Arbor, Mich.: National Education Association, 1913. Pp. xi, 827.

This volume, expressing as it does the opinions of a large number of representative educators, may well be taken as a kind of barometer of popular education in this country. From this point of view it is gratifying to note that respect for the scientific attitude in education and recognition of its value in attacking educational problems are on the increase. A considerable percentage of the addresses give evidence of sympathy with scientific methods.

EMILIE KIP BAKER. *Stories of Old Greece and Rome.* New York: The Macmillan Company, 1913. Pp. xii, 382. $1.50 net.

The author gives a simple and delightful rendition of the classic tales. The book should contribute materially to the love of reading in children of the higher school grades, and should furnish an excellent background for later studies in literature. A noteworthy feature is the large number of splendid illustrations.

ELIZABETH V. BROWN. *Stories of Woods and Fields.* Pp. 192. *When the World Was Young.* Pp. 160. *Stories of Childhood and Nature.* Pp. 223. Yonkers-on-Hudson: World Book Co., 1913. 40 cents each.

This series of supplementary readers is entitled Nature and Industry Readers, and furnishes interesting reading material in connection with work in nature study, geography, and elementary science. The stories and poems are attractive and richly illustrated.

G. R. CARPENTER, F. T. BAKER AND FRED N. SCOTT. *The Teaching of English in the Elementary and Secondary School.* New York: Longmans, Green and Company, 1913. Pp. viii, 383. $1.50.

In this new edition of the well-known, classical treatise on the teaching of English it is to be regretted that the authors have not seized the opportunity to take account of recent discussions in this field. No mention is made of the experimental point of view, and practically the only change discoverable is the inclusion of a brief supplemental bibliography.

KARL M. DALLENBACH. *The Measurement of Attention.* Reprinted from the American Journal of Psychology. Vol. XXIV, October, 1913. 465-507.

Under the conditions of the experiment the time of reaction served to measure the attention, while distraction of any sort tended to lessen the degree of attention. The difficulty of obtaining a graded series of distractors is very great.

EDUCATION IN VERMONT. Bulletin No. 7. New York: Carnegie Foundation for the Advancement of Teaching, 1914. Pp. 214.

This survey of educational conditions in Vermont includes a study of the elementary and secondary schools, the training and supply of teachers, and the organization and functions of Vermont colleges. The report recommends the withdrawal of state aid from higher institutions of learning, and the concentration of funds on the improvement of the lower schools, particularly on the preparation of teachers.

RUDOLF EUCKEN. *Ethics and Modern Thought.* New York: G. P. Putnam's Sons, 1913. Pp. 127. $1.00 net.

A series of six lectures delivered at New York University in 1913. The titles are: The Ethical Problem in the Present Time, The Ethical Principle, A Defence of the Ethical Principle, Evolution of the Ethical Principle, Morality and Religion, and The Present Status of Morality.

Help Your Own School. Suggestions. New York: Bureau of Municipal Research, 1914. Pp. 32. 15 cents.

The sub-title of this pamphlet reads: "Extracts from a field study of P. S. 188B, Manhattan, made at the request of Principal Edward Mandel." The most salient feature of the study is the variety of diagrams used to portray the conditions found. The striking nature of these diagrams renders the report attractive to the eye, but sometimes obscures rather than clarifies the points at issue.

WILLIAM GRANVILLE HUMMEL AND BERTHA ROYCE HUMMEL. *Materials and Methods in High School Agriculture.* New York: The Macmillan Company, 1913. Pp. x, 385. $1.25.

A selection of those agricultural data which will be of value in high schools where most of the students are drawn from a farming population, or where the prosperity of the high school community is largely dependent upon agriculture. Each chapter contains valuable lists of books for the teacher.

HARRY MILES JOHNSON. *Audition and Habit Formation in the Dog.* Animal Behavior Monographs, No. 8. New York: Henry Holt & Co., 1913. Pp. iv, 78. $1.00.

A critical examination of previous work on pitch discrimination in dogs, and extended original experiments combine to render doubtful the extent to which dogs discriminate pitch at all. The learning of blind and normal dogs is strikingly alike. Probably normal dogs rely chiefly on kinaesthetic and muscular sense processes in their learning,—a type of adjustment which has been abundantly demonstrated in the rat.

W. FRANKLIN JONES. *The Child's Own Spelling Book.* Pierre, S. D.: Capital Supply Company, 1913. Pp. 152.

Until the Simplified Spelling Board shall have secured a much wider acceptance of its reforms than it has at present, there will be need for such systematic work in spelling as calls for the use of a spelling book. The present book marks something of a departure in spellers. It is constructed on the basis of an extended research to determine the writing vocabularies of elementary school children, and makes liberal use of the principles developed in recent contributions to the teaching of spelling. It deserves the careful attention of scientific students of the teaching of spelling. A feature of the book is the space reserved for private lists of misspelled words.

Journal of the Michigan Schoolmasters' Club. Ann Arbor, Mich.: Published by the Club, Forty-sixth Meeting, 1911. Pp. vi, 172. Forty-seventh Meeting, 1912. Pp. vi, 190.

A high standard is set in the discussion of topics before this club, and the Journal furnishes interesting and valuable reading. The General Sessions of 1911 considered the subject of changes in college entrance requirements, and in 1912 the chief subjects were high school mathematics and the school as a social center.

J. SCOTT KELTIE AND O. J. R. HOWARTH. *History of Geography.* New York: G. P. Putnam's Sons, 1913. Pp. vii, 208. 75 cents.

A very interesting little sketch of the history of geography and cartography which will furnish the teacher of geography with much illustrative material. A more general familiarity with the history and significance of geography would lead to its introduction into our secondary and college curricula.

LILLI LEHMANN. *How to sing.* New York: The Macmillan Company, 1914. Pp. xiii, 323. $1.75.

A new and revised edition of this great artist's treatise on singing. No singer now living has given more thoughtful attention to effective

tone production, and this book in the hands of a conscientious and intelligent teacher will be of the greatest value in voice building. The work is replete with diagrams and illustrations, and is valuable from both a psychological and a pedagogical point of view.

E. B. LOWRY. *Truths.* Chicago: Forbes & Co., 1913. Pp. 95. $0.50.

Intimate talks with a young boy on the elements of sexual functions. A very helpful book to parents and teachers who have difficulty in approaching the subject of sex instruction.

E. B. LOWRY. *Confidences.* Chicago: Forbes & Co., 1913. Pp. 94. $0.50.

A book of the same character as "Truths," but written for girls. These two little books should do much toward removing parental prejudice regarding instruction in matters of sex.

E. B. LOWRY. *False Modesty.* Chicago: Forbes & Co., 1913. Pp. 110. $0.50.

A strong plea for home education, showing the grave results of children's ignorance of sex functions and insisting that education in the home is the first step toward better conditions. Written in convincing style for those who still believe in the "policy of silence."

E. B. LOWRY. *Herself.* Chicago: Forbes & Co., 1913. Pp. 221. $1.00.

A book for adolescent girls and young women similar to the author's "Confidences," written frankly and wholesomely; the sort of book that can be given out for reading in place of verbal instruction. The author advances many convincing arguments relative to the need for instruction in the relations of the sexes, and believes that education, though not a cure-all, will greatly better prevailing conditions. The book is very readable and is without technical terminology. In its technical aspects the book is not so accurate as might be desired, and many topics are not treated with the thoroughness that is needed to allay desire for further information that may be had elsewhere in less desirable form.

E. B. LOWRY AND RICHARD J. LAMBERT. *Himself.* Chicago: Forbes & Co., 1913. Pp. 226. $1.00.

A book for adolescent boys and young men similar to "Herself." In this book the authors go outside the field of personal hygiene into the more widely social aspects of the sex relations. The functions of parentage and the marital relations are discussed in a way that should be beneficial to all persons above the age of puberty. There is a strong and sane chapter on the subject of the prevention of conception. The authors believe that present legislation prohibiting the

imparting of information tending toward the restriction of offspring not only fails to accomplish its purpose but actually defeats it.

These five books by Dr. Lowry (the last one in collaboration with Dr. Lambert) are among the landmarks of the growing movement in the dissemination of sex information. They should do much to answer the criticism that the evils of sex instruction are apt to be worse than its good. They offer, moreover, advice as well as information, and are therefore all the more helpful.

CYRUS D. MEAD. *The Age of Walking and Talking in Relation to General Intelligence.* Reprinted from the Pedagogical Seminary, Vol. XX, December, 1913. Pp. 460-484.

The median "normal" child begins to walk at 13.54 months, probable error 1.06 months, and to talk at 15.8 months, probable error 2.83 months. The median feeble-minded child begins to walk at 21.6 months, probable error 7.56 months, and to talk at 34.44 months, probable error 12.84 months. Boys of both classes learn to walk and talk later than girls.

CHARLES D. MUSGROVE. *Nervous Breakdowns and How to Avoid Them.* New York: Funk and Wagnalls Company, 1913. Pp. viii, 188. $1.00 net.

In view of the tremendous pace of modern business and social life, and of the alarming increase in nervous disorders, there is need for the advice indicated in the above title. The book is easily read and understood by everyone, and the discussion is so simple as to be somewhat superficial in its avoidance of the technical problems involved.

S. W. NEWMAYER. *Medical and Sanitary Inspection of Schools.* Philadelphia: Lea and Febiger, 1913. Pp. vi, 318.

This book is the outcome of twelve years' experience in the work of medical inspection of school children. After a brief historical introduction it takes up the administration of inspection, the school buildings and grounds, infectious, contagious and communicable diseases, and physical defects. Under the latter topic there is a discussion of mentality, with a fairly complete description of the Binet-Simon tests. It is a useful, practical book, and its value is enhanced by the large number of colored plates.

Papers Presented for Discussion at the Meeting of the Society of College Teachers of Education, Richmond, Va., Feb. 24, 1914. Chicago: University of Chicago Press, 1914. Pp. iii, 82. $0.60.

The central topics of discussion were the rating, placing and promotion of teachers, and educational surveys. Important papers were "The Rating of Teachers in Service," by Lotus D. Coffman, University

of Illinois; "Cooperation between Sections and States for the Placing and Promotion of Teachers," W. S. Sutton, University of Texas, and Edward C. Elliott, University of Wisconsin, and "The Advantages of a State Teachers' Agency," George F. James, University of Minnesota. The significance of city and state school surveys was discussed by Paul H. Hanus, Harvard University, and by M. B. Hillegas, Columbia University. Other features of the monograph are a bibliography of recent school surveys, and a list of educational investigations now in progress under the supervision of members of the Society.

LAURA L. PLAISTED. *Handwork and Its Place in Early Education.* Oxford: The Clarendon Press, 1913. Pp. xiii, 327. 4s. net.

An extremely valuable book for the primary teacher. "Experience has taught that restless and inquiring pupils need a variety of forms of employment, hence an attempt has been made to indicate as many as possible of the simple arts and crafts open to them." The chapters discuss Froebel's Gifts and Occupations, suggestions for the employment of little children, paper folding and cutting, modelling, light woodwork, drawing, primitive industries, handwork in connection with history and geography, basketry, weaving, pottery, and needlework.

WILHELM RAABE. *Die schwarze Galeere.* Edited by Charles Allyn Williams. New York: Oxford University Press, 1913. Pp. iv, 154.

An interesting historical tale well adapted for rapid reading by a second year class.

Report of the Committee on School Inquiry, Board of Estimate and Apportionment, City of New York. New York: Published by the City, 1911-1913. Vol. I, Pp. 820. Vol. II, Pp. 829. Vol. III, Pp. 924.

The final and complete edition of the mammoth undertaking that has occupied the attention of the educational public for over three years. The report of Professor Moore on the Board of Education is, of course, omitted, but Vol. III contains the reports of Professors Goodnow and Howe, who were appointed in Professor Moore's place.

Report of the Ohio State School Survey Commission, Horace L. Brittain, Director. Columbus, Ohio: 1914. Pp. xv, 352. 20 cents, postage.

A valuable and suggestive discussion of the problem of rural schools. The report furnished the starting point for some of the most constructive and progressive rural school legislation that is to be found in any state.

Report of the Registrar of the University of Illinois for the Biennium ending June 30, 1913. Urbana, Ill.: Published by the University, 1913. Pp. 132.

This represents a timely and praiseworthy effort to render the information accumulated by the university registrar available for the use of the university faculty, the people of the state, and the wider public. The report is a model of clearness and effectiveness, and it is to be hoped that other institutions will be stimulated to like publications.

Report of the Survey of the Public School System of the City of Portland, Oregon. Portland: Published by the City, 1913. Pp. xx, 317.

This survey was conducted by Professor Ellwood P. Cubberley, Leland Stanford University, assisted by Dr. Fletcher B. Dresslar, Peabody College for Teachers; Dr. Edward C. Elliott, University of Wisconsin; Superintendent J. H. Francis, Los Angeles; Superintendent Frank E. Spaulding, Newton, and Dr. Lewis M. Terman, Leland Stanford University. While not as voluminous as the New York City report, it contains valuable discussions of the conditions which prevail in the western city.

WALLACE RICE, Editor. *Women and Morality.* Chicago: The Laurentian Publishers, 1914. Pp. xii, 102. $1.00.

Three frank and candid discussions of the relations between the sexes, written from as many different points of view. The writers exhibit a mastery of their subject that is satisfying and stimulating.

W. CARSON RYAN, JR. *School Hygiene. Report of the Fourth International Congress of School Hygiene, held at Buffalo, N. Y., August* 25-30, 1913. Bulletin No. 559. Washington: Bureau of Education, 1913. Pp. 121.

Contains abstracts of the important papers presented at the Congress.

PETER SCHERER AND LOUIS H. DIRKS. *Deutsche Lieder.* Cincinnati: The American Book Co., 1913. Pp. 110.

An attractive selection of German songs with music. Could be used to advantage in almost every German class.

M. C. SCHUYTEN. *Paedologisch Jaarboek. Achtste Jaargang.* Paris: Schleicher Freres, 1913. Pp. 323.

The discussions are in Flemish, with sometimes a brief resume in French. The greater part of the book is taken up with a bibliography of 4027 titles, containing classified lists of the important contributions to education during the past decade.

Some Aspects of High School Instruction and Administration. The Thirteenth Yearbook of the National Society for the Study of Education. Part I. Chicago: University of Chicago Press, 1914. Pp. 124. $0.75.

The Yearbook contains *Reconstructed Mathematics in the High School,* a closely reasoned argument for the radical reduction of the requirements in high school mathematics by Henry C. Morrison, *Supervised Study as a Means of Providing Supplementary Individual Instruction,* by E. R. Breslich, and a report on the North Central High Schools, by Walter A. Jessup and Lotus D. Coffman.

THEODOR STORM. *Psyche: Eine Novelle.* Edited with notes by Ewald Eiserhardt and Ray W. Pettengill. New York: Oxford University Press, 1913. Pp. xiii, 111.

A charming love story in easy simple German.

LEWIS M. TERMAN. *A Report of the Buffalo Conference on the Binet-Simon Tests of Intelligence.* Reprinted from Pedagogical Seminary, Vol. XX, December, 1913. 549-554.

Brief abstracts of ten papers dealing with various phases of work with mental tests.

ERNEST L. THURSTON. *Business Arithmetic for Secondary Schools.* New York: The Macmillan Company, 1913. Pp. xiv, 431.

In the preparation of this book material has been gathered only from living and reliable sources, and the selection has been made with the purpose of emphasizing how arithmetic is applied for a definite object. The book contains an interesting chapter on graphic arithmetic.

EMMA SERL. *In the Animal World.* New York: Silver, Burdett & Co., 1913. Pp. 232.

A charmingly illustrated, entertainingly written supplementary reader for the second and third grades. It will furnish an excellent introduction to subsequent nature study work.